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(57) Abstract: The present invention encompasses albumin fusion proteins. Nucleic acid molecules encoding the albumin fusion proteins of the invention are also encompassed by the invention, as are vectors containing these nucleic acids, host cells transformed with these nucleic acids vectors, and methods of making the albumin fusion proteins of the invention and using these nucleic acids, vectors, and/or host cells. Additionally the present invention encompasses pharmaceutical compositions comprising albumin fusion proteins and methods of treating, preventing, or ameliorating diseases, disorders or conditions using albumin fusion proteins of the invention.

ALBUMIN FUSION PROTEINS

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BACKGROUND OF THE INVENTION

The invention relates generally to Therapeutic proteins (including, but not limited to, a polypeptide, antibody, or peptide, or fragments and variants thereof) fused to albumin or fragments or variants of albumin. The invention further relates to Therapeutic proteins (including, but not limited to, a polypeptide, antibody, or peptide, or fragments and variants thereof) fused to albumin or fragments or variants of albumin, that exhibit extended shelf-life and/or extended or therapeutic activity in solution. These fusion proteins are herein collectively referred to as "albumin fusion proteins of the invention." The invention encompasses therapeutic albumin fusion proteins, compositions, pharmaceutical compositions, formulations and kits. Nucleic acid molecules encoding the albumin fusion proteins of the invention are also encompassed by the invention, as are vectors containing these nucleic acids, host cells transformed with these nucleic acids vectors, and methods of making the albumin fusion proteins of the invention using these nucleic acids, vectors, and/or host cells.

The invention is also directed to methods of *in vitro* stabilizing a Therapeutic protein via fusion or conjugation of the Therapeutic protein to albumin or fragments or variants of albumin.

Human serum albumin (HSA, or HA), a protein of 585 amino acids in its mature form (as shown in Figure 15 or in SEQ ID NO:18), is responsible for a significant proportion of the osmotic pressure of serum and also functions as a carrier of endogenous and exogenous ligands. At present, HA for clinical use is produced by extraction from human blood. The production of recombinant HA (rHA) in microorganisms has been disclosed in EP 330 451 and EP 361 991.

The role of albumin as a carrier molecule and its inert nature are desirable properties for use as a carrier and transporter of polypeptides *in vivo*. The use of albumin as a component of an albumin fusion protein as a carrier for various proteins has been suggested in WO 93/15199, WO 93/15200, and EP 413 622. The use of N-terminal fragments of HA for fusions to polypeptides has also been proposed (EP 399 666). Fusion of albumin to the Therapeutic protein may be achieved by genetic manipulation, such that the DNA coding for HA, or a fragment thereof, is joined to the DNA coding for the Therapeutic protein. A suitable host is then transformed or transfected with the fused nucleotide sequences, so

arranged on a suitable plasmid as to express a fusion polypeptide. The expression may be effected *in vitro* from, for example, prokaryotic or eukaryotic cells, or *in vivo e.g.* from a transgenic organism.

Therapeutic proteins in their native state or when recombinantly produced, such as interferons and growth hormones, are typically labile molecules exhibiting short shelf-lives, particularly when formulated in aqueous solutions. The instability in these molecules when formulated for administration dictates that many of the molecules must be lyophilized and refrigerated at all times during storage, thereby rendering the molecules difficult to transport and/or store. Storage problems are particularly acute when pharmaceutical formulations must be stored and dispensed outside of the hospital environment. Many protein and peptide drugs also require the addition of high concentrations of other protein such as albumin to reduce or prevent loss of protein due to binding to the container. This is a major concern with respect to proteins such as IFN. For this reason, many Therapeutic proteins are formulated in combination with large proportion of albumin carrier molecule (100-1000 fold excess), though this is an undesirable and expensive feature of the formulation.

Few practical solutions to the storage problems of labile protein molecules have been proposed. Accordingly, there is a need for stabilized, long lasting formulations of proteinaceous therapeutic molecules that are easily dispensed, preferably with a simple formulation requiring minimal post-storage manipulation.

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SUMMARY OF THE INVENTION

The present invention is based, in part, on the discovery that Therapeutic proteins may be stabilized to extend the shelf-life, and/or to retain the Therapeutic protein's activity for extended periods of time in solution, *in vitro* and/or *in vivo*, by genetically or chemically fusing or conjugating the Therapeutic protein to albumin or a fragment (portion) or variant of albumin, that is sufficient to stabilize the protein and/or its activity. In addition it has been determined that the use of albumin-fusion proteins or albumin conjugated proteins may reduce the need to formulate protein solutions with large excesses of carrier proteins (such as albumin, unfused) to prevent loss of Therapeutic proteins due to factors such as binding to the container.

The present invention encompasses albumin fusion proteins comprising a Therapeutic protein (e.g., a polypeptide, antibody, or peptide, or fragments and variants thereof) fused to albumin or a fragment (portion) or variant of albumin. The present invention also encompasses albumin fusion proteins comprising a Therapeutic protein (e.g., a polypeptide, antibody, or peptide, or fragments and variants thereof) fused to albumin or a fragment (portion) or variant of albumin, that is sufficient to prolong the shelf life of the Therapeutic

protein, and/or stabilize the Therapeutic protein and/or its activity in solution (or in a pharmaceutical composition) in vitro and/or in vivo. Nucleic acid molecules encoding the albumin fusion proteins of the invention are also encompassed by the invention, as are vectors containing these nucleic acids, host cells transformed with these nucleic acids vectors, and methods of making the albumin fusion proteins of the invention and using these nucleic acids, vectors, and/or host cells.

The invention also encompasses pharmaceutical formulations comprising an albumin fusion protein of the invention and a pharmaceutically acceptable diluent or carrier. Such formulations may be in a kit or container. Such kit or container may be packaged with instructions pertaining to the extended shelf life of the Therapeutic protein. Such formulations may be used in methods of treating, preventing, ameliorating, or diagnosing a disease or disease symptom in a patient, preferably a mammal, most preferably a human, comprising the step of administering the pharmaceutical formulation to the patient.

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In other embodiments, the present invention encompasses methods of preventing treating, or ameliorating a disease or disorder. In preferred embodiments, the present invention encompasses a method of treating a disease or disorder listed in the "Preferred Indication Y" column of Table 1 comprising administering to a patient in which such treatment, prevention or amelioration is desired an albumin fusion protein of the invention that comprises a Therapeutic protein portion corresponding to a Therapeutic protein (or fragment or variant thereof) disclosed in the "Therapeutic Protein X" column of Table 1 (in the same row as the disease or disorder to be treated is listed in the "Preferred Indication Y" column of Table 1) in an amount effective to treat prevent or ameliorate the disease or disorder.

In another embodiment, the invention includes a method of extending the shelf life of a Therapeutic protein (e.g., a polypeptide, antibody, or peptide, or fragments and variants thereof) comprising the step of fusing or conjugating the Therapeutic protein to albumin or a fragment (portion) or variant of albumin, that is sufficient to extend the shelf-life of the Therapeutic protein. In a preferred embodiment, the Therapeutic protein used according to this method is fused to the albumin, or the fragment or variant of albumin. In a most preferred embodiment, the Therapeutic protein used according to this method is fused to albumin, or a fragment or variant of albumin, via recombinant DNA technology or genetic engineering.

In another embodiment, the invention includes a method of stabilizing a Therapeutic protein (e.g., a polypeptide, antibody, or peptide, or fragments and variants thereof) in solution, comprising the step of fusing or conjugating the Therapeutic protein to albumin or a fragment (portion) or variant of albumin, that is sufficient to stabilize the Therapeutic protein. In a preferred embodiment, the Therapeutic protein used according to this method is fused to

the albumin, or the fragment or variant of albumin. In a most preferred embodiment, the Therapeutic protein used according to this method is fused to albumin, or a fragment or variant of albumin, via recombinant DNA technology or genetic engineering.

The present invention further includes transgenic organisms modified to contain the nucleic acid molecules of the invention, preferably modified to express the albumin fusion proteins encoded by the nucleic acid molecules.

BRIEF DESCRIPTION OF THE FIGURES

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Figure 1 depicts the extended shelf-life of an HA fusion protein in terms of the biological activity (Nb2 cell proliferation) of HA-hGH remaining after incubation in cell culture media for up to 5 weeks at 37°C. Under these conditions, hGH has no observed activity by week 2.

Figure 2 depicts the extended shelf-life of an HA fusion protein in terms of the stable biological activity (Nb2 cell proliferation) of HA-hGH remaining after incubation in cell culture media for up to 3 weeks at 4, 37, or 50°C. Data is normalized to the biological activity of hGH at time zero.

Figures 3A and 3B compare the biological activity of HA-hGH with hGH in the Nb2 cell proliferation assay. Figure 3A shows proliferation after 24 hours of incubation with various concentrations of hGH or the albumin fusion protein, and Figure 3B shows proliferation after 48 hours of incubation with various concentrations of hGH or the albumin fusion protein.

Figure 4 shows a map of a plasmid (pPPC0005) that can be used as the base vector into which polynucleotides encoding the Therapeutic proteins (including polypeptide and fragments and variants thereof) may be cloned to form HA-fusions. Plasmid Map key: PRB1p: PRB1 S. cerevisiae promoter; FL: Fusion leader sequence; rHA: cDNA encoding HA: ADH1t: ADH1 S. cerevisiae terminator; T3: T3 sequencing primer site; T7: T7 sequencing primer site; Amp R: β-lactamase gene; ori: origin of replication. Please note that in the provisional applications to which this application claims priority, the plasmid in Figure 4 was labeled pPPC0006, instead of pPPC0005. In addition the drawing of this plasmid did not show certain pertinent restriction sites in this vector. Thus in the present application, the drawing is labeled pPPC0005 and more restriction sites of the same vector are shown.

Figure 5 compares the recovery of vial-stored HA-IFN solutions of various concentrations with a stock solution after 48 or 72 hours of storage.

Figure 6 compares the activity of an HA- α -IFN fusion protein after administration to monkeys via IV or SC.

Figure 7 describes the bioavailability and stability of an HA- α -IFN fusion protein.

Figure 8 is a map of an expression vector for the production of HA-_-IFN.

Figure 9 shows the location of loops in HA.

Figure 10 is an example of the modification of an HA loop.

Figure 11 is a representation of the HA loops.

Figure 12 shows the HA loop IV.

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Figure 13 shows the tertiary structure of HA.

Figure 14 shows an example of a scFv-HA fusion

Figure 15 shows the amino acid sequence of the mature form of human albumin (SEQ 10 NO:18) and a polynucleotide encoding it (SEQ ID NO:17).

DETAILED DESCRIPTION

As described above, the present invention is based, in part, on the discovery that a Therapeutic protein (e.g., a polypeptide, antibody, or peptide, or fragments and variants thereof) may be stabilized to extend the shelf-life and/or retain the Therapeutic protein's activity for extended periods of time in solution (or in a pharmaceutical composition) in vitro and/or in vivo, by genetically fusing or chemically conjugating the Therapeutic protein, polypeptide or peptide to all or a portion of albumin sufficient to stabilize the protein and its activity.

The present invention relates generally to albumin fusion proteins and methods of treating, preventing, or ameliorating diseases or disorders. As used herein, "albumin fusion protein" refers to a protein formed by the fusion of at least one molecule of albumin (or a fragment or variant thereof) to at least one molecule of a Therapeutic protein (or fragment or variant thereof). An albumin fusion protein of the invention comprises at least a fragment or variant of a Therapeutic protein and at least a fragment or variant of human serum albumin, which are associated with one another, preferably by genetic fusion (i.e., the albumin fusion protein is generated by translation of a nucleic acid in which a polynucleotide encoding all or a portion of a Therapeutic protein is joined in-frame with a polynucleotide encoding all or a portion of albumin) or chemical conjugation to one another. The Therapeutic protein and albumin protein, once part of the albumin fusion protein, may be referred to as a "portion", "region" or "moiety" of the albumin fusion protein (e.g., a "Therapeutic protein portion" or an "albumin protein portion").

In one embodiment, the invention provides an albumin fusion protein comprising, or alternatively consisting of, a Therapeutic protein (e.g., as described in Table 1) and a serum albumin protein. In other embodiments, the invention provides an albumin fusion protein comprising, or alternatively consisting of, a biologically active and/or therapeutically active

fragment of a Therapeutic protein and a serum albumin protein. In other embodiments, the invention provides an albumin fusion protein comprising, or alternatively consisting of, a biologically active and/or therapeutically active variant of a Therapeutic protein and a serum albumin protein. In preferred embodiments, the serum albumin protein component of the albumin fusion protein is the mature portion of serum albumin.

In further embodiments, the invention provides an albumin fusion protein comprising, or alternatively consisting of, a Therapeutic protein, and a biologically active and/or therapeutically active fragment of serum albumin. In further embodiments, the invention provides an albumin fusion protein comprising, or alternatively consisting of, a Therapeutic protein and a biologically active and/or therapeutically active variant of serum albumin. In preferred embodiments, the Therapeutic protein portion of the albumin fusion protein is the mature portion of the Therapeutic protein. In a further preferred embodiment, the Therapeutic protein portion of the albumin fusion protein is the extracellular soluble domain of the Therapeutic protein. In an alternative embodiment, the Therapeutic protein portion of the albumin fusion protein is the active form of the Therapeutic protein.

In further embodiments, the invention provides an albumin fusion protein comprising, or alternatively consisting of, a biologically active and/or therapeutically active fragment or variant of a Therapeutic protein and a biologically active and/or therapeutically active fragment or variant of serum albumin. In preferred embodiments, the invention provides an albumin fusion protein comprising, or alternatively consisting of, the mature portion of a Therapeutic protein and the mature portion of serum albumin.

Therapeutic proteins

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As stated above, an albumin fusion protein of the invention comprises at least a fragment or variant of a Therapeutic protein and at least a fragment or variant of human serum albumin, which are associated with one another, preferably by genetic fusion or chemical conjugation.

As used herein, "Therapeutic protein" refers to proteins, polypeptides, antibodies, peptides or fragments or variants thereof, having one or more therapeutic and/or biological activities. Therapeutic proteins encompassed by the invention include but are not limited to, proteins, polypeptides, peptides, antibodies, and biologics. (The terms peptides, proteins, and polypeptides are used interchangeably herein.) It is specifically contemplated that the term "Therapeutic protein" encompasses antibodies and fragments and variants thereof. Thus an albumin fusion protein of the invention may contain at least a fragment or variant of a Therapeutic protein, and/or at least a fragment or variant of an antibody. Additionally, the term "Therapeutic protein" may refer to the endogenous or naturally occurring correlate of a

Therapeutic protein.

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By a polypeptide displaying a "therapeutic activity" or a protein that is "therapeutically active" is meant a polypeptide that possesses one or more known biological and/or therapeutic activities associated with a Therapeutic protein such as one or more of the Therapeutic proteins described herein or otherwise known in the art. As a non-limiting example, a "Therapeutic protein" is a protein that is useful to treat, prevent or ameliorate a disease, condition or disorder. As a non-limiting example, a "Therapeutic protein" may be one that binds specifically to a particular cell type (normal (e.g., lymphocytes) or abnormal e.g., (cancer cells)) and therefore may be used to target a compound (drug, or cytotoxic agent) to that cell type specifically.

In another non-limiting example, a "Therapeutic protein" is a protein that has a biological activity, and in particular, a biological activity that is useful for treating preventing or ameliorating a disease. A non-inclusive list of biological activities that may be possessed by a Therapeutic protein includes, enhancing the immune response, promoting angiogenesis, inhibiting angiogenesis, regulating hematopoietic functions, stimulating nerve growth, enhancing an immune response, inhibiting an immune response, or any one or more of the biological activities described in the "Biological Activities" section below.

As used herein, "therapeutic activity" or "activity" may refer to an activity whose effect is consistent with a desirable therapeutic outcome in humans, or to desired effects in non-human mammals or in other species or organisms. Therapeutic activity may be measured in vivo or in vitro. For example, a desirable effect may be assayed in cell culture. As an example, when hGH is the Therapeutic protein, the effects of hGH on cell proliferation as described in Example 1 may be used as the endpoint for which therapeutic activity is measured. Such in vitro or cell culture assays are commonly available for many Therapeutic proteins as described in the art. Examples of assays include, but are not limited to those described herein in the Examples section or in the "Exemplary Activity Assay" column of Table 1.

Therapeutic proteins corresponding to a Therapeutic protein portion of an albumin fusion protein of the invention, such as cell surface and secretory proteins, are often modified by the attachment of one or more oligosaccharide groups. The modification, referred to as glycosylation, can dramatically affect the physical properties of proteins and can be important in protein stability, secretion, and localization. Glycosylation occurs at specific locations along the polypeptide backbone. There are usually two major types of glycosylation: glycosylation characterized by O-linked oligosaccharides, which are attached to serine or threonine residues; and glycosylation characterized by N-linked oligosaccharides, which are attached to asparagine residues in an Asn-X-Ser/Thr sequence, where X can be any amino

acid except proline. N-acetylneuramic acid (also known as sialic acid) is usually the terminal residue of both N-linked and 0-linked oligosaccharides. Variables such as protein structure and cell type influence the number and nature of the carbohydrate units within the chains at different glycosylation sites. Glycosylation isomers are also common at the same site within a given cell type.

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For example, several types of human interferon are glycosylated. Natural human interferon-c2 is O-glycosylated at threonine 106, and N-glycosylation occurs at asparagine 72 in interferon-α14 (Adolf et al., J. Biochem 276:511 (1991); Nyman TA et al., J. Biochem 329:295 (1998)). The oligosaccharides at asparagine 80 in natural interferon-β1α may play an important factor in the solubility and stability of the protein, but may not be essential for its biological activity. This permits the production of an unglycosylated analog (interferon-β1b) engineered with sequence modifications to enhance stability (Hosoi et al., J. Interferon Res. 8:375 (1988; Karpusas et al., Cell Mol Life Sci 54:1203 (1998); Knight, J. Interferon Res. 2:421 (1982); Runkel et al., Pharm Res 15:641 (1998); Lin, Dev. Biol. Stand. 96:97 (1998))1. Interferon-γ contains two N-linked oligosaccharide chains at positions 25 and 97, both important for the efficient formation of the bioactive recombinant protein, and having an influence on the pharmacokinetic properties of the protein (Sareneva et al., Eur. J. Biochem 242:191 (1996); Sareneva et al., Biochem J. 303:831 (1994); Sareneva et al., J. Interferon Res. 13:267 (1993)). Mixed O-linked and N-linked glycosylation also occurs, for example in human erythropoietin, N-linked glycosylation occurs at asparagine residues located at positions 24, 38 and 83 while O-linked glycosylation occurs at a serine residue located at position 126 (Lai et al., J. Biol. Chem. 261:3116 (1986); Broudy et al., Arch. Biochem. Biophys. 265:329 (1988)).

Therapeutic proteins corresponding to a Therapeutic protein portion of an albumin fusion protein of the invention, as well as analogs and variants thereof, may be modified so that glycosylation at one or more sites is altered as a result of manipulation(s) of their nucleic acid sequence, by the host cell in which they are expressed, or due to other conditions of their expression. For example, glycosylation isomers may be produced by abolishing or introducing glycosylation sites, e.g., by substitution or deletion of amino acid residues, such as substitution of glutamine for asparagine, or unglycosylated recombinant proteins may be produced by expressing the proteins in host cells that will not glycosylate them, e.g. in E. coli or glycosylation-deficient yeast. These approaches are described in more detail below and are known in the art.

Therapeutic proteins (particularly those disclosed in Table 1) and their nucleic acid sequences are well known in the art and available in public databases such as Chemical Abstracts Services Databases (e.g., the CAS Registry), GenBank, and GenSeq as shown in Table 1.

Additional Therapeutic proteins corresponding to a Therapeutic protein portion of an albumin fusion protein of the invention include, but are not limited to, one or more of the Therapeutic proteins or peptides disclosed in the "Therapeutic Protein X" column of Table 1, or fragment or variable thereof.

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Table 1 provides a non-exhaustive list of Therapeutic proteins that correspond to a Therapeutic protein portion of an albumin fusion protein of the invention. The "Therapeutic Protein X" column discloses Therapeutic protein molecules followed by parentheses containing scientific and brand names that comprise, or alternatively consist of, that Therapeutic protein molecule or a fragment or variant thereof. "Therapeutic protein X" as used herein may refer either to an individual Therapeutic protein molecule (as defined by the amino acid sequence obtainable from the CAS and Genbank accession numbers), or to the entire group of Therapeutic proteins associated with a given Therapeutic protein molecule disclosed in this column. The "Exemplary Identifier" column provides Chemical Abstracts Services (CAS) Registry Numbers (published by the American Chemical Society) and/or Genbank Accession Numbers ((e.g., Locus ID, NP_XXXXX (Reference Sequence Protein), and XP_XXXXX (Model Protein) identifiers available through the national Center for Biotechnology Information (NCBI) webpage at www.ncbi.nlm.nih.gov) that correspond to entries in the CAS Registry or Genbank database which contain an amino acid sequence of the Therapeutic Protein Molecule or of a fragment or variant of the Therapeutic Protein Molecule. In addition GenSeq Accession numbers and/or journal publication citations are given to identify the exemplary amino acid sequence for some polypeptides. The summary pages associated with each of these CAS and Genbank and GenSeq Accession Numbers as well as the cited journal publications (e.g., PubMed ID number (PMID)) are each incorporated by reference in their entireties, particularly with respect to the amino acid sequences described therein. The "PCT/Patent Reference" column provides U.S. Patent numbers, or PCT International Publication Numbers corresponding to patents and/or published patent applications that describe the Therapeutic protein molecule. Each of the patents and/or published patent applications cited in the "PCT/Patent Reference" column are herein incorporated by reference in their entireties. In particular, the amino acid sequences of the specified polypeptide set forth in the sequence listing of each cited "PCT/Patent Reference", the variants of these amino acid sequences (mutations, fragments, etc.) set forth, for example, in the detailed description of each cited "PCT/Patent Reference", the therapeutic indications set

forth, for example, in the detailed description of each cited "PCT/Patent Reference", and the activity asssays for the specified polypeptide set forth in the detailed description, and more particularly, the examples of each cited "PCT/Patent Reference" are incorporated herein by reference. The "Biological activity" column describes Biological activities associated with the Therapeutic protein molecule. The "Exemplary Activity Assay" column provides references that describe assays which may be used to test the therapeutic and/or biological activity of a Therapeutic protein or an albumin fusion protein of the invention comprising a Therapeutic protein X portion. Each of the references cited in the "Exemplary Activity Assay" column are herein incorporated by reference in their entireties, particularly with respect to the description of the respective activity assay described in the reference (see Methods section, for example) for assaying the corresponding biological activity set forth in the "Biological Activity" column of Table 1. The "Preferred Indication Y" column describes disease, disorders, and/or conditions that may be treated, prevented, diagnosed, or ameliorated by Therapeutic protein X or an albumin fusion protein of the invention comprising a Therapeutic protein X portion.

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Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
BMP-1	GeneSeq Accession P80618	WO8800205	BMP1 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic proteins induce cartilage and bone formation, play an important role in nephrogenesis, and play an important role in the development of many organs, including lung, heart, teeth, gut, skin, and particularly the kidney.	BMP-1 activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84–8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes
BMP-2	GeneSed Accession P80619	WO8800205	BMP-2 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	BMP-2 activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes
BMP-2B	GeneSeq Accession W24850	US5631142	BMR-2b belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	BMP-2b activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84–8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes
BMP-4	GeneSeq Accession B02796	WO0020591	BMP-4 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	BMP-4 activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
BMP-5	GeneSeq Accession B02797	· WO0020591	BMP-5 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	BMP-5 activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes
BMP-6	GeneSeg Accession R32904	US5187076	BMP-6 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	BMP-6 activity can be determined using the following assays known in the art. Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes
Osteogenic Protein-1; OP-1; BMP-7	GeneSeq Accession W34783	WO9734626	OP-1 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	OP-1 activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes
Osteogenic Protein-2	GeneSeq Accession R57973	WO9406399	OP-2 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	OP-2 activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes

Preferred Indication Y	Developmental disorders, Induction of Cartilage, Tissue and Bone Growth, and Diabetes	Induction of Cartilage, Tissue and Bone Growth, and Diabetes
Exemplary Activity Assay	The effect of GDF-1 on signaling can be assayed by treating Primary BAECs transfected with a construct called p3TP-Lux, containing a TGF-beta responsive promoter fused to a reporter gene, and measuring luciferase gene expression (Wrana et al., 1994, Nature 370: 341-347).	BMP-9 activity can be determined using the following assays known in the art. Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.
Biological Activity	Members of the TGF-beta family of proteins initiate cell signaling by binding to heteromeric receptor complexes of type I (TbetaRI) and type II (TbetaRI) serine/threonine kinase receptors (reviewed by Massague, J. et al. (1994) Trends Cell Biol. 4:172-178; Miyazono, K. et al. (1994) Adv. Immunol. 55:181-220). Activation of this heteromeric receptor complex occurs when TGF-beta. binds to TbetaRII, which then recruits and phosphorylates TbetaRI. Activated TbetaRI then propagates the signal to downstream targets (Chen, F. and Weinberg, R. A. (1995) PNAS92:1565-1569; Wrana, J. L. et al. (1994) Nature 370:341-347).	BMP-9 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.
PCT/Patent Number	WO9406449	WO9533830
Exemplary Identifier	GeneSeq Accession R60961	GeneSeq Accession R86903
Therapeutic Protein X	GDF-1	BMP-9

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
BMP-10	GeneSed Accession R66202	WO9426893	BMP-10 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	BMP-10 activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes
BMP-12	GeneSeq Accession R78734	WO9516035	BMP-12 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	BMP-12 activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes
BMP-15	GeneSeq Accession W11261	WO9636710	BMP-15 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	BMP-15 activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes
BMP-17	GeneSeq Accession Y17870	WO9929718	BMP-17 belongs to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.	BMP-17 activity can be determined using the following assays known in the art: Nat Genet. 2001 Jan,27(1):84–8; Eur J Biochem 1996 Apr 1,237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	Induction of Cartilage, Tissue and Bone Growth, and Diabetes

ι Y	or bone	or bone	ies
Preferred Indication Y	BMP Antagonist useful for Osteosarcoma, abnormal bone growth	BMP Antagonist useful for Osteosarcoma, abnormal bone growth	Bone formation or Regeneration Abnormalities
Exemplary Activity Assay	BMP activity, in the presence of the antagonist Cerebus, can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	BMP activity, in the presence of the soluble antagonist BMP receptor kinase protein-3, can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.	BMP activity, in the presence of the Furin, can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295- 302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.
Biological Activity	Cerebus is believed to be involved in the inhibition of BMP activity	Soluble BMP receptor kinase protein-3 is involved in the binding of BMPs. Soluble BMP receptor kinase protein-3 is useful as an antagonist for the inhibition of BMP activity	BMPs belong to the transforming growth factor-beta (TGFB) superfamily. Bone morphogenic protein induces bone formation.
PCT/Patent Number	WO9849296	WO9614579	W09741250
Exemplary Identifier	GeneSeq Accession W86032	Soluble BMP GeneSeg Receptor Kinase Accession R95227 Protein-3	GeneSeq Accession W36099
Therapeutic Protein X	Cerebus Protein	Soluble BMP Receptor Kinase Protein-3	BMP Processing Enzyme Furin

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Preferred Indication Y	useful for treating cancer and to promote wound healing
Exemplary Activity Assay	The effect of TGF betas on signaling can be assayed by treating Primary BAECs transfected with a construct called p3TP-Lux, containing a TGF-beta responsive promoter fused to a reporter gene, and measuring luciferase gene expression (Wrana et al., 1994, Nature 370: 341-347).
Biological Activity	Members of the TGF-beta family of proteins initiate cell signaling by binding to heteromeric receptor complexes of type I (TbetaRI) and type II (TbetaRII) promoter fused to a reporter (reviewed by Massague, J. et al. (1994) Trends Cell Biol. 4:172-178; Miyazono, K. et al. (1994) Trends Cell Biol. 4:172-178; Miyazono, K. et al. (1994) Nature 370: 341-347). Adv. Immunol. 55:181-220). Activation of this heteromeric receptor complex occurs when TGF-beta. binds to TbetaRII, which then recruits and phosphorylates TbetaRII. Activated TbetaRI then propagates the signal to downstream targets (Chen, F. and Weinberg, R. A. (1995) PNAS92:1565-1569; Wrana, J. L. et al. (1994) Nature 370:341-347).
PCT/Patent Number	W09216228
Exemplary Identifier	GeneSeq Accession R29657
Therapeutic Protein X	TGF-beta 1

Preferred Indication Y	useful for treating cancer and to promote wound healing	
Exemplary Activity Assay	The effect of TGF betas on signaling can be assayed by treating Primary BAECs transfected with a construct called p3TP-Lux, containing a TGF-beta responsive promoter fused to a reporter gene, and measuring luciferase gene expression (Wrana et al., 1994, Nature 370: 341-347).	
Biological Activity	Members of the TGF-beta family The effect of TGF betas on of proteins initiate cell signaling signaling can be assayed by by binding to heteromeric receptor complexes of type I (TbetaRI) and type II (TbetaRII) promoter fused to a reporte (reviewed by Massague, J. et al. (1994) Trends Cell Biol. 4:172-178; Miyazono, K. et al. (1994) Nature 370: 341-347). Adv. Immunol. 55:181-220). Activation of this heteromeric receptor complex occurs when TGF-beta. binds to TbetaRII, which then recruits and phosphorylates TbetaRI. Activated TbetaRI then propagates the signal to downstream targets (Chen, F. and Weinberg, R. A. (1995) PNAS92:1565-1569; Wrana, J. L. et al. (1994) Nature 370:341-	347).
PCT/Patent Number	EP542679	
Exemplary Identifier	GeneSeq Accession R39659	
Therapeutic Protein X	TGF-beta 2	

Preferred Indication Y	useful for treating cancer and to promote wound healing	
Exemplary Activity Assay	The effect of TGF betas on signaling can be assayed by treating Primary BAECs transfected with a construct called p3TP-Lux, containing a TGF-beta responsive promoter fused to a reporter gene, and measuring luciferase gene expression (Wrana et al., 1994, Nature 370: 341-347).	
Biological Activity	Members of the TGF-beta family of proteins initiate cell signaling by binding to heteromeric receptor complexes of type I (TbetaRI) and type II (TbetaRII) serine/threonine kinase receptors (reviewed by Massague, J. et al. (1994) Trends Cell Biol. 4:172-178; Miyazono, K. et al. (1994) Adv. Immunol. 55:181-220). Activation of this heteromeric receptor complex occurs when TGF-beta. binds to TbetaRII, which then recruits and phosphorylates TbetaRI then propagates the signal to downstream targets (Chen, F. and Weinberg, R. A. (1995) PNAS92:1565-1569; Wrana, J. L. et al. (1994) Nature 370:341-	347).
PCT/Patent Number	WO0015798	
Exemplary Identifier	GeneSeq Accession Y70654	
Therapeutic Protein X	ZTGF-beta 9	

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Preferred Indication Y	Useful for control of fibrosis,	immune, and inflammatory	disease																***************************************			
Exemplary Activity Assay	The effect of TGF betas on	signaling, in the presence of an anti-	TGF beta antibody, can be assayed	by treating Primary BAECs	transfected with a construct called	p3TP-Lux, containing a TGF-beta	responsive promoter fused to a	reporter gene, and measuring	luciferase gene expression (Wrana	et al., 1994, Nature 370: 341-347).												
Biological Activity	Members of the TGF-beta family The effect of TGF betas on	of proteins initiate cell signaling	by binding to heteromeric	receptor complexes of type I	(TbetaRI) and type II (TbetaRII)	serine/threonine kinase receptors	(reviewed by Massague, J. et al.	(1994) Trends Cell Biol. 4:172-	178; Miyazono, K. et al. (1994)	Adv. Immunol. 55:181-220).	Activation of this heteromeric	receptor complex occurs when	TGF-beta. binds to TbetaRII,	which then recruits and	phosphorylates TbetaRI.	Activated ThetaRI then	propagates the signal to	downstream targets (Chen, F.	and Weinberg, R. A. (1995)	PNAS92:1565-1569; Wrana, J.	L. et al. (1994) Nature 370:341-	347).
PCT/Patent Number	GB2305921									-												
Exemplary Identifier																						
Therapeutic Protein X	Anti-TGF beta	family	antibodies																			

Preferred Indication Y	Useful for inhibiting tissue or tumor growth
Exemplary Activity Assay	The effect of TGF betas on signaling, in the presence of a TGF-beta binding protein, can be assayed by treating Primary BAECs transfected with a construct called p3TP-Lux, containing a TGF-beta responsive promoter fused to a reporter gene, and measuring luciferase gene expression (Wrana et al., 1994, Nature 370: 341-347).
Biological Activity	Members of the TGF-beta family of proteins initiate cell signaling by binding to heteromeric receptor complexes of type I (TbetaRI) and type II (TbetaRI) and type II (TbetaRI) and type II (TbetaRI) and type II (TbetaRI) are serine/threonine kinase receptors (reviewed by Massague, J. et al. (1994) Trends Cell Biol. 4:172- reporter gene, and measurin 178; Miyazono, K. et al. (1994) Trends Cell Biol. 4:172- reporter gene, and measurin 178; Miyazono, K. et al. (1994) Nature 370:34 activated TbetaRI then recruits and phosphorylates TbetaRI. Activated TbetaRI then propagates the signal to downstream targets (Chen, F. and Weinberg, R. A. (1995) PNAS92:1565-1569; Wrana, J. L. et al. (1994) Nature 370:341-
PCT/Patent Number	WO0012551
Exemplary Identifier	GeneSeq Accession Y70552
Therapeutic Protein X	Latent TGF- beta binding protein II

Preferred Indication Y	Bone formation Abnormalities Regeneration Abnormalities	BMP Antagonist useful for Osteosarcoma, abnormal bone growth
Exemplary Activity Assay	The effect of TGF betas on signaling can be assayed by treating Primary BAECs transfected with a construct called p3TP-Lux, containing a TGF-beta responsive promoter fused to a reporter gene, and measuring luciferase gene expression (Wrana et al., 1994, Nature 370: 341-347).	BMP activity, in the presence of b57 protein, can be determined using the following assays known in the art: Nat Genet. 2001 Jan;27(1):84-8; Eur J Biochem 1996 Apr 1;237(1):295-302; J Biol Chem, Vol. 274, Issue 16, 10897-10902, April 16, 1999; and Hogan, B. L. M. (1996) Genes Dev. 10, 1580-1594.
Biological Activity	Members of the TGF-beta family of proteins initiate cell signaling by binding to heteromeric receptor complexes of type I (TbetaRI) and type II (TbetaRII) serine/threonine kinase receptors (reviewed by Massague, J. et al. (1994) Trends Cell Biol. 4:172-178; Miyazono, K. et al. (1994) Adv. Immunol. 55:181-220). Activation of this heteromeric receptor complex occurs when TGF-beta. binds to TbetaRII, which then recruits and phosphorylates TbetaRI. Activated TbetaRI then propagates the signal to downstream targets (Chen, F. and Weinberg, R. A. (1995) PNAS92:1565-1569; Wrana, J. I. et al. (1994) Nature 370:341-347).	BMPs are involved in the induction of bone formation. Specific antagonists are useful is preventing this activity from occurring.
PCT/Patent Number	W09741250	WO9837195
Exemplary Identifier	GeneSeq Accession W36100	GeneSeq Accession W69293
Therapeutic Protein X	MP52	b57 Protein

Preferred Indication Y	Type II diabetes and Syndrome X	Lactose intolerance	Obesity, Metabolic disorders, Lipid Metabolism; Hormone Secretion	Obesity, Metabolic disorders, Lipid Metabolism; Hormone Secretion	Diabetes mellitus; Regulation of Insulin secretory response; Insulin mediated glucose transport disorders
Exemplary Activity Assay	Ability of resistin to influence type II diabetes can be determined using assays known in the art. Pontoglio et al., J Clin Invest 1998 May 15;101(10):2215-22.	Ability of Galectin-4 polypeptides to bind lactose can be determined using assays known in the art: Wada et al., J Biol Chem 1997 Feb 28;272(9):6078-86.	Ability of ACRP30 polypeptides to influence obesity and fat oxidation can be determined using assays known in the art: Fruebis et al., Proc Natl Acad Sci U S A 2001 Feb 13;98(4):2005-10.	Ability of ACRP30 homologue polypeptides to influence obesity and fat oxidation can be determined using assays known in the art: Fruebis et al., Proc Natl Acad Sci U S A 2001 Feb 13;98(4):2005-10.	Ability of Calpain-10 to influence type II diabetes can be determined using assays known in the art: Pontoglio et al., J Clin Invest 1998 May 15:101(10):2215-22.
Biological Activity	This gene belongs to the family defined by mouse FIZZI and FIZZ3/Resistin genes. The characteristic feature of this family is the C-terminal stretch of 10 cys residues with identical spacing. The mouse homolog of this protein is secreted by adipocytes, and may be the hormone potentially linking obesity to type II diabetes.	Galectins are a family of carbohydrate-binding proteins characterized by an affinity for beta-galactoside containing glycoconjugates.	ACPR30 gene is exclusively expressed in adipose tissue. ACRP30 is thought to increase fatty acid oxidation by muscle tissue.	ACPR30 gene is exclusively expressed in adipose tissue. ACRP30 is thought to increase fatty acid oxidation by muscle tissue.	Calpain is believed to play a role in insulin secretion and insulin activity, and therefore may be useful in the treatment of type II diabetes.
PCT/Patent Number	WO0064920	WO9703190	WO0026363	WO0063376	WO0023603
Exemplary Identifier	GeneSeq Accession W69293	GeneSeq Accession W11841	GeneSeq Accession Y71035	GeneSeq Accession B30234	GeneSeq Accession Y79567
Therapeutic Protein X	Resistin	Galectin-4	APM-1; ACRP-30; Famoxin	ACRP-30 Homologue; Complement Component C1q	Calpain-10a

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Calpain-10b	GeneSeq Accession Y79568	WO0023603	Calpain is believed to play a role in insulin secretion and insulin activity, and therefore may be useful in the treatment of type II diabetes.	Ability of Calpain-10 to influence type II diabetes can be determined using assays known in the art: Pontoglio et al., J Clin Invest 1998 May 15;101(10):2215-22.	Diabetes mellitus; Regulation of Insulin secretory response; Insulin mediated glucose transport disorders
Calpain-10c	GeneSeq Accession Y79569	WO0023603	Calpain is believed to play a role in insulin secretion and insulin activity, and therefore may be useful in the treatment of type II diabetes.	Ability of Calpain-10 to influence type II diabetes can be determined using assays known in the art: Pontoglio et al., J Clin Invest 1998 May 15;101(10):2215-22.	Diabetes mellitus; Regulation of Insulin secretory response; Insulin mediated glucose transport disorders
PDGF-D	GeneSeq Accession Y71130	WO0027879	Vascular Endothelial Growth Factor	Proliferation assay using NR6R- 3T3 cells (Rizzino 1988 Cancer Res. 48: 4266)	Wound Healing; Atherosclerosis
FasL	GeneSeq Accession Y28594	WO9936079	Activities associated with apoptosis and immune system functions.	Activities associated with Activity can be determined using Apoptosis-related disorders; apoptosis and immune system Apoptosis assays known in the art: Autoimmune disorders, Graft-functions. Walczak et al. (1996) EMBOJ 16: v-Host disorders 5386-5397.	Apoptosis-related disorders; Autoimmune disorders; Graft- v-Host disorders
Chondromoduli n-like protein	GeneSeq Accession Y71262	WO0029579	Chondromodulin proteins are cartilage proteins thought to confer resistance to angiogenesis, and thus are useful as anti-angiogenic agents that may have utility in combating cancer.	Ability of Chondromodulin-like protein to inhibit vascularization can be determined using assays known in the art. Hiraki et al., J Biol Chem 1997 Dec 19;272(51):32419-26.	Antiangiogenic agent; Osteoblast proliferation stimulator; prevents vascularization of cartilage tissue; Useful to treat cancer.
Patched	GeneSeq Accession W72969	US5837538	Patched is a tumour-suppressor receptor for Sonic hedgehog (shh), which is a protein that controls developmental patterning and growth.	Ability of soluble Patched to bind to and inhibit the activities of shh can be determined using assays known in the art: Stone et al., Nature 1996 Nov 14;384(6605):129-34.	Receptor for Hedgehog cellular proliferation signaling molecule. This receptor is useful as a means of preventing cellular proliferation via the shh signaling pathway, thus useful for cancers.

Exen	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
GeneSeq Accession Y43261		WO9953058	Patched is a tumour-suppressor receptor for Sonic hedgehog (shh), which is a protein that	Ability of soluble Patched to bind to and inhibit the activities of shh can be determined using assays known in the out. Stong of all Mornes 1006	Receptor for Hedgehog cellular proliferation signaling molecule. This receptor is
			controls developmental patterning and growth.	III ute art. Stolie et ar., Nature 1990 Nov 14;384(6605):129-34.	user ut as a means of preventing cellular proliferation via the shh signaling pathway, thus useful for cancers.
GeneSeq Accession R50938		WO9405804	Maspin is a member of the serpin family of serine protease	The inhibitory effects of Maspin and other protease inhibitors can be	Tumor suppressor which is down-regulated in breast
			inhibitors that is thought to suppress tumor metastasis.	assayed using methods known in the art such as a labeled protease	cancers. The mapsin protein has tumour
				Protease Substrate (casein, resorufin-labeled): Roche Molecular	suppressing activity
GeneSeq		WO0064946	Endostatin is believed to inhibit	The inhibitory effects of endostatin	Anti-angiogenic activity.
Accession B28399			effects of capillary endothelial cell proliferation.	can be assayed using assays disclosed by Cao et al (1996) J.	Useful in the prevention and/or treatment of cancers.
				Biol. Chem. 271 29461-29467	
GeneSeq		EP298723	Fibroblast Growth Factor	Proliferation assay using NR6R-	Promotion of growth and
Accession P9403/				313 cells (Kizzino 1988 Cancer Res. 48: 4266): Examples 23 and 39	proliteration of cells, such as epithelial cells and
				disclosed herein.	keratinocytes. Antagonists
					may be useful as anti-cancer
	ī				agents
GeneSeq Accession R06685	10	FR2642086	Fibroblast Growth Factor	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer	Promotion of growth and proliferation of cells, such as
	, -			Res. 48: 4266); Examples 23 and 39	epithelial cells and
				disclosed herein.	keratinocytes. Antagonists
					may be useful as anti-cancer
					agents

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
FGF-3; INT-2	GeneSeq Accession R07824	WO9503831	Fibroblast Growth Factor	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266); Examples 23 and 39 disclosed herein.	Promotion of growth and proliferation of cells, such as epithelial cells and keratinocytes. Antagonists may be useful as anti-cancer agents
FGF-4; HBGF-4	GeneSeq Accession R07825	WO9503831	Fibroblast Growth Factor	Proliferation assay using NRGR-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266); Examples 23 and 39 disclosed herein.	Promotion of growth and proliferation of cells, such as epithelial cells and keratinocytes. Antagonists may be useful as anti-cancer agents
FGF-5	GeneSeq Accession W22600	WO9730155	Fibroblast Growth Factor	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266); Examples 23 and 39 disclosed herein.	Promotion of growth and proliferation of cells, such as epithelial cells and keratinocytes. Antagonists may be useful as anti-cancer agents
FGF-6; Heparin binding secreted transforming factor-2	GeneSeq Accession R58555	EP613946	Fibroblast Growth Factor	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266); Examples 23 and 39 disclosed herein.	Promotion of growth and proliferation of cells, such as epithelial cells and keratinocytes. Antagonists may be useful as anti-cancer agents
FGF-8	GeneSeq Accession R80783	WO9524928	Fibroblast Growth Factor	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266); Examples 23 and 39 disclosed herein.	Promotion of growth and proliferation of cells, such as epithelial cells and keratinocytes. Antagonists may be useful as anti-cancer agents

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Preferred Indication Y	Promotion of growth and proliferation of cells, such as epithelial cells and keratinocytes. Antagonists may be useful as anti-cancer agents	Promotion of growth and proliferation of cells, such as epithelial cells and keratinocytes. Antagonists may be useful as anti-cancer agents	Promotion of growth and proliferation of cells, such as epithelial cells and keratinocytes. Antagonists may be useful as anti-cancer agents	Promotion of growth and proliferation of cells, such as epithelial cells and keratinocytes. Antagonists may be useful as anti-cancer agents	Promotion of growth and proliferation of cells, such as epithelial cells and keratinocytes, Antagonists may be useful as anti-cancer agents
Exemplary Activity Assay	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266); Examples 23 and 39 disclosed herein.	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266); Examples 23 and 39 disclosed herein.	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266); Examples 23 and 39 disclosed herein.	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266); Examples 23 and 39 disclosed herein.	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266); Examples 23 and 39 disclosed herein.
Biological Activity	Fibroblast Growth Factor				
PCT/Patent Number	WO9503831	80 <i>LS</i> E96OM	WO9927100	WO9918128	WO9927100
Exemplary Identifier	GeneSeq Accession R70822	GeneSeq Accession W06309	GeneSeq Accession Y08582	GeneSeq Accession Y05474	GeneSeq Accession Y08590
Therapeutic Protein X	FGF-9; Glia activating factor	FGF-12; Fibroblast growth factor homologous factor-1	FGF-15	FGF-16	FGF-18

Preferred Indication Y	Promotion of immune cell growth and/or differentiation ne	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as anti-angiogenic agents, and may be applicable for cancer	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as anti-angiogenic agents, and may be applicable for cancer	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as anti-angiogenic agents, and may be applicable for cancer	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as anti-angiogenic agents, and
Exemplary Activity Assay	Chemokine activities can be determined using assays known in the art: Methods in Molecular Biology, 2000, vol. 138: Chemokine Protocols. Edited by: A.E.I. Proudfoot, T.N.C. Wells, and C.A. Power. © Humana Press Inc., Totowa, NJ	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.
Biological Activity	Stem Cell Progenitor	Promotes the growth and/or proliferation of endothelial cells	Promotes the growth and/or proliferation of endothelial cells	Promotes the growth and/or proliferation of endothelial cells	Promotes the growth and/or proliferation of endothelial cells
PCT/Patent Number	EP627487	WO0013702	WO0071713	WO9940197	WO0013702
Exemplary Identifier	GeneSeq Accession R67541	GeneSeq Accession Y69417	GeneSeq Accession B50432	GeneSeq Accession Y43483	GeneSeq Accession Y69413
Therapeutic Protein X	flt-3 ligand	VEGF-110	VEGF-121	VEGF-138	VEGF-145

PCT/Patent Number Biological Activity WO0040107 Promotes the growth and/or	Biological Activity		Exempla	Exemplary Activity Assay	Preferred Indication Y
GeneSeq WO9940197 Promotes the growth and/or VEGF Accession proliferation of endothelial cells using a st those Y43484 as those Public	Promotes the growth and/or proliferation of endothelial cells	sells	VEGI using as tho: Public	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as
exe	exe	exa	exa	example.	anti-angiogenic agents, and may be applicable for cancer
WO0013702 Promotes the growth and/or	Promotes the growth and/or		>	VEGF activity can be determined	Promotion of growth and
proliferation of endothelial cells			_	using assays known in the art, such	proliferation of cells, such as
Y69414				as those disclosed in International	vascular endothelial cells.
				Publication No. WO0045835, for	Antagonists may be useful as
				example.	anti-angiogenic agents, and may he applicable for cancer
GeneSeq W09940197 Promotes the growth and/or		Promotes the growth and/or	1	VEGF activity can be determined	Promotion of growth and
Accession proliferation of endothelial cells	proliferation of endothelial cells	proliferation of endothelial cells		using assays known in the art, such	proliferation of cells, such as
Y43483				as those disclosed in International	vascular endothelial cells.
				Publication No. WO0045835, for	Antagonists may be useful as
				example.	anti-angiogenic agents, and
					may be applicable for cancer
GeneSeq WO0013702 Promotes the growth and/or		romotes the growth and/or		VEGF activity can be determined	Promotion of growth and
Accession proliferation of endothelial cells	proliferation of endothelial cells	proliferation of endothelial cells		using assays known in the art, such	proliferation of cells, such as
Y69415				as those disclosed in International	vascular endothelial cells.
				Publication No. WO0045835, for	Antagonists may be useful as
				example.	anti-angiogenic agents, and
					may be applicable for cancer
GeneSeq WO0013702 Promotes the growth and/or		Promotes the growth and/or		VEGF activity can be determined	Promotion of growth and
Accession proliferation of endothelial cells	proliferation of endothelial cells	proliferation of endothelial cells		using assays known in the art, such	proliferation of cells, such as
Y69416				as those disclosed in International	vascular endothelial cells.
				Publication No. WO0045835, for	Antagonists may be useful as
				example.	anti-angiogenic agents, and
					may be applicable for cancer

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
VEGF-D	GeneSeq Accession W53240	WO9807832	Promotes the growth and/or proliferation of endothelial cells	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as anti-angiogenic agents, and may be applicable for cancer
VEGF-E; VEGF-X	GeneSeq Accession Y33679	WO9947677	Promotes the growth and/or proliferation of endothelial cells	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as anti-angiogenic agents, and may be applicable for cancer
VEGF Receptor, KDR; flk-1	GeneSeq Accession W69679	WO9831794	Receptor for VEGF polypeptides VEGF activity, in the presence of flk-1 polypeptides, can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	VEGF activity, in the presence of flk-1 polypeptides, can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	VEGF Receptor. Fusion protein with the extracellular domain is useful as an antiangiogenic agent. Agonists may be useful in the promotion of angiogenesis
Soluble VEGF Receptor	GeneSeq Accession W47037	US5712380	Receptor for VEGF polypeptides	VEGF activity, in the presence of VEGF Receptor polypeptides, can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	VEGF Receptor. Fusion protein with the extracellular domain is useful as an antiangiogenic agent. Agonists may be useful in the promotion of angiogenesis
fit-1	GeneSeq Accession Y70751	WO0021560	Receptor for VEGF polypeptides	VEGF activity, in the presence of flt-1 polypeptides, can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	VEGF Receptor. Fusion protein with the extracellular domain is useful as an antiangiogenic agent. Agonists may be useful in the promotion of angiogenesis

		l			
Preferred Indication Y	VEGF Receptor. Fusion protein with the extracellular domain is useful as an antiangiogenic agent. Agonists may be useful in the promotion of angiogenesis	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as anti-angiogenic agents, and may be applicable for cancer	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as anti-angiogenic agents, and may be applicable for cancer	Anti-angiogenesis	Anti-angiogenesis
Exemplary Activity Assay	VEGF activity, in the presence of flt-4 polypeptides, can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	Troponins are contractile Ability of soluble Troponins to Anti-angiogenesis proteins that are thought to inhibit angiogenesis can be inhibit angiogenesis. High levels determined using assays known in may contibute to the difficulty the art Proc Natl Acad Sci U S A encountered in revascularizing 1999 Mar 16;96(6):2645-50. the ischemic myocardium after cardiovascular injury.	Troponins are contractile Ability of soluble Troponins to Anti-angiogenesis proteins that are thought to inhibit angiogenesis can be inhibit angiogenesis. High levels determined using assays known in may contibute to the difficulty the art. Proc Natl Acad Sci U S A encountered in revascularizing 1999 Mar 16;96(6):2645-50. The ischemic myocardium after cardiovascular injury.
Biological Activity	Receptor for VEGF polypeptides	Vascular Endothelial Growth Factor	Vascular Endothelial Growth Factor	Troponins are contractile Ability of soluble Tropoproteins that are thought to inhibit angiogenesis inhibit angiogenesis. High levels determined using assays k may contibute to the difficulty the art. Proc Natl Acad Sc encountered in revascularizing 1999 Mar 16;96(6):2645-50 the ischemic myocardium after cardiovascular injury.	Troponins are contractile Ability of soluble Tropoporoins that are thought to inhibit angiogenesis inhibit angiogenesis. High levels determined using assays k may contibute to the difficulty the art. Proc Natl Acad Scencountered in revascularizing 1999 Mar 16;96(6):2645-50, the ischemic myocardium after cardiovascular injury.
PCT/Patent Number	WO0058511	WO9929858	WO9929858	WO9730085	WO9730085
Exemplary Identifier	GeneSeq Accession B29047	GeneSeq Accession Y06319	GeneSeq Accession Y03618	GeneSeq Accession W22597	GeneSeq Accession W22598
Therapeutic Protein X	VEGF R-3; flt-4	Neuropilin-1	Neuropilin-2	Human fast twitch skeletal muscle troponin C	Human fast twitch skeletal muscle troponin L

Preferred Indication Y	Anti-angiogenesis	Anti-angiogenesis	Anti-angiogenesis	Anti-angiogenesis	Anti-angiogenesis
Exemplary Activity Assay	Troponins are contractile Ability of soluble Troponins to Anti-angiogenesis proteins that are thought to inhibit angiogenesis can be inhibit angiogenesis. High levels determined using assays known in may contibute to the difficulty the arr. Proc Natl Acad Sci U S A encountered in revascularizing 1999 Mar 16;96(6):2645-50. the ischemic myocardium after cardiovascular injury.	Troponins are contractile Ability of soluble Troponins to Anti-angiogenesis proteins that are thought to inhibit angiogenesis can be inhibit angiogenesis. High levels determined using assays known in may contibute to the difficulty the art. Proc Natl Acad Sci U S A encountered in revascularizing 1999 Mar 16;96(6):2645-50. the ischemic myocardium after cardiovascular injury.	Troponins are contractile Ability of soluble Troponins to Anti-angiogenesis proteins that are thought to inhibit angiogenesis can be inhibit angiogenesis. High levels determined using assays known in may contibute to the difficulty the art. Proc Natl Acad Sci U S A encountered in revascularizing 1999 Mar 16;96(6):2645-50. the ischemic myocardium after cardiovascular injury.	Troponins are contractile Ability of soluble Troponins to Anti-angiogenesis proteins that are thought to inhibit angiogenesis can be inhibit angiogenesis. High levels determined using assays known in may contibute to the difficulty the arr. Proc Natl Acad Sci U S A encountered in revascularizing 1999 Mar 16;96(6):2645-50. the ischemic myocardium after cardiovascular injury.	Troponins are contractile Ability of soluble Troponins to Anti-angiogenesis proteins that are thought to inhibit angiogenesis can be inhibit angiogenesis. High levels determined using assays known in may contibute to the difficulty the arr. Proc Natl Acad Sci U S A encountered in revascularizing 1999 Mar 16;96(6):2645-50. the ischemic myocardium after cardiovascular injury.
Biological Activity	Troponins are contractile Ability of soluble Tropoproteins that are thought to inhibit angiogenesis inhibit angiogenesis. High levels determined using assays kmay contibute to the difficulty the arr. Proc Natl Acad Scencountered in revascularizing 1999 Mar 16;96(6):2645-50, the ischemic myocardium after cardiovascular injury.	Troponins are contractile Ability of soluble Trop proteins that are thought to inhibit angiogenesis inhibit angiogenesis. High levels determined using assays k may contibute to the difficulty like art. Proc Natl Acad Sc encountered in revascularizing 1999 Mar 16;96(6):2645-50 the ischemic myocardium after cardiovascular injury.	Troponins are contractile Ability of soluble Tropoproteins that are thought to inhibit angiogenesis inhibit angiogenesis. High levels determined using assays kmay contibute to the difficulty the art. Proc Natl Acad Scencountered in revascularizing 1999 Mar 16;96(6):2645-50. the ischemic myocardium after cardiovascular injury.	Troponins are contractile Ability of soluble Tropoproteins that are thought to inhibit angiogenesis inhibit angiogenesis. High levels determined using assays kerner contibute to the difficulty the art. Proc Natl Acad Scencountered in revascularizing 1999 Mar 16;96(6):2645-50 the ischemic myocardium after cardiovascular injury.	Troponins are contractile Ability of soluble Tropoproteins that are thought to inhibit angiogenesis dinibit angiogenesis. High levels determined using assays k may contibute to the difficulty the arr Proc Natl Acad Sc encountered in revascularizing 1999 Mar 16;96(6):2645-50, the ischemic myocardium after cardiovascular injury.
PCT/Patent Number	WO9730085	WO9719955	WO9719955	WO9933874	WO0054770
Exemplary Identifier	GeneSeq Accession W22599	GeneSeq Accession W18053	GeneSeq Accession W18054	GeneSeq Accessions Y29581, Y29582, Y29583, Y29584, Y29585, and Y29586	GeneSeq Accession B00134
Therapeutic Protein X	Human fast twitch skeletal muscle troponin T	fragment. myofibrillar protein Troponin I	myofibrillar contractile protein Troponin I	Troponin peptides	Human fast twitch skeletal muscle Troponin subunit C.

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Human fast	GeneSeq	WO0054770	Troponins are contractile	contractile Ability of soluble Troponins to Anti-angiogenesis	Anti-angiogenesis
twitch skeletal	Accession B00135		proteins that are thought to	proteins that are thought to inhibit angiogenesis can be	
muscle			inhibit angiogenesis. High levels	inhibit angiogenesis. High levels determined using assays known in	
ponin			may contibute to the difficulty	may contibute to the difficulty the art:. Proc Natl Acad Sci U S A	
subunit I			encountered in revascularizing 1999 Mar 16;96(6):2645-50.	1999 Mar 16;96(6):2645-50.	
Protein			the ischemic myocardium		
			after cardiovascular injury.		
Human fast	GeneSeq	WO0054770	Troponins are contractile	contractile Ability of soluble Troponins to Anti-angiogenesis	Anti-angiogenesis
twitch skeletal	Accession B00136		proteins that are thought to	proteins that are thought to inhibit angiogenesis can be	
muscle			inhibit angiogenesis. High levels	inhibit angiogenesis. High levels determined using assays known in	
oponin			may contibute to the difficulty	may contibute to the difficulty the art Proc Natl Acad Sci U S A	
subunit T			encountered in revascularizing 1999 Mar 16;96(6):2645-50.	1999 Mar 16;96(6):2645-50.	
			the ischemic myocardium		
			after cardiovascular injury.		
Plasminogen	GeneSeq	WO9013648	PAIs are believed to play a role	PAIs are believed to play a role Methods that measure plasminogen Anti-angiogenesis;	Anti-angiogenesis; blood-
Activator	Accession R08411		in cancer, and cardiovascular	in cancer, and cardiovascular activator inhibitor (PAI) activity are clotting disorders.	clotting disorders.
Inhibitor-1;			disease and blood-clotting	and blood-clotting known in the art, for example, assay	•
AI-1			disorders.	the ability of PAI to inhibit tissue	
				plasminogen activator (tPA) or	
				urokinase (uPA): J Biochem	
				Biophys Methods 2000 Sep	
				11;45(2):127-40, Breast Cancer Res	
				Treat 1996;41(2):141-6. Methods	
				that measure anti-angiogenesis	
				activity are known in the art, for	
				example, Proc Natl Acad Sci U S A	
_				1999 Mar 16;96(6):2645-50.	-

on Y	-bood-	-boold
Preferred Indication Y	isorders.	giogenesis; lisorders.
Prefe	Anti-an	Anti-ang
Exemplary Activity Assay	Methods that measure plasminogen activator inhibitor (PAI) activity are known in the art, for example, assay the ability of PAI to inhibit tissue plasminogen activator (tPA) or urokinase (uPA): J Biochem Biophys Methods 2000 Sep 11;45(2):127-40, Breast Cancer Res Treat 1996;41(2):141-6. Methods that measure anti-angiogenesis activity are known in the art, for example, Proc Natl Acad Sci U S A 1999 Mar 16;96(6):2645-50.	ed to play a role Methods that measure plasminogen cardiovascular activator inhibitor (PAI) activity are blood-clotting known in the art, for example, assay the ability of PAI to inhibit tissue plasminogen activator (tPA) or urokinase (uPA): J Biochem Biophys Methods 2000 Sep 11;45(2):127-40, Breast Cancer Res Treat 1996;41(2):141-6. Methods that measure anti-angiogenesis activity are known in the art, for example, Proc Natl Acad Sci U S A 1999 Mar 16;96(6):2645-50.
Ехе	Methods activator known in the ability plasminc urokinas Biophys 111;45(2): Treat 19 that me activity example, 1999 Mai	Methods activator known in the ability plasming urokinas Biophys Biophys 11;45(2): Treat 19 that me activity example, 1999 Mai
Biological Activity	PAIs are believed to play a role Methods that measure plasminogen Anti-angiogenesis; in cancer, and cardiovascular activator inhibitor (PAI) activity are disease and blood-clotting known in the art, for example, assay the ability of PAI to inhibit tissue plasminogen activator (tPA) or urokinase (uPA): J Biochem Biophys Methods 2000 Sep 11;45(2):127-40, Breast Cancer Res Treat 1996;41(2):141-6. Methods that measure anti-angiogenesis activity are known in the art, for example, Proc Natl Acad Sci U S A 1999 Mar 16;96(6):2645-50.	PAIs are believed to play a role Methods that measure plasminogen Anti-angiogenesis; in cancer, and cardiovascular activator inhibitor (PAI) activity are clotting disorders. disease and blood-clotting known in the art, for example, assay the ability of PAI to inhibit tissue plasminogen activator (tPA) or urokinase (uPA): J Biochem Biophys Methods 2000 Sep 11;45(2):127-40, Breast Cancer Res Treat 1996;41(2):141-6. Methods that measure anti-angiogenesis activity are known in the art, for example, Proc Natl Acad Sci U S A 1999 Mar 16;96(6):2645-50.
PCT/Patent Number	DE3722673	WO9102057
Exemplary Identifier	GeneSeq Accession P94160	GeneSeq Accession R10921
Therapeutic Protein X	Plasminogen Activator Inhibitor-2; PAI-2	Plasminogen Activator Inhibitor-2; PAI-2

Preferred Indication Y	onti-angiogenesis; blood-lotting disorders.	Soluble CXCR3 polypeptides may be useful for inhibiting chemokine activities and viral infection.
Exemplary Activity Assay	PAIs are believed to play a role Methods that measure plasminogen Anti-angiogenesis; in cancer, and cardiovascular activator inhibitor (PAI) activity are clotting disorders. disorders. the ability of PAI to inhibit tissue plasminogen activator (tPA) or urokinase (uPA): J Biochem Biophys Methods 2000 Sep 11;45(2):127-40, Breast Cancer Res Treat 1996;41(2):141-6. Methods that measure anti-angiogenesis activity are known in the art, for example, Proc Natl Acad Sci U S A 1999 Mar 16;96(6):2645-50.	e activities can be using assays known in dethods in Molecular 00, vol. 138: Chemokine Edited by: A.E.I. T.N.C. Wells, and C.A. Humana Press Inc.,
Biological Activity	PAIs are believed to play a role in cancer, and cardiovascular disease and blood-clotting disorders.	Chemokines are a family of Chemokine related small, secreted proteins determined involved in biological processes the art: Managing from hematopoiesis, Biology, 20 angiogenesis, and leukocyte Protocols. trafficking. Members of this Proudfoot, family are involved in a similarly Power. © diverse range of pathologies Totowa, NJ including inflammation, allergy, tissue rejection, viral infection, and tumor biology. The chemokines exert their effects by acting on a family of seven transmembrane G-protein-coupled receptors. Over 40 human chemokines have been described, which bind to ~17 receptors thus far identified.
PCT/Patent Number		WO0018431
Exemplary Identifier	GeneSeq Accessions R11755, R11756, R11757, R11758, R117761, R11762, and R11763	GeneSeq Accession Y79372
Therapeutic Protein X	Human PAI-1 mutants	CXCR3; CXC chemokine receptor 3

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Modified	GeneSeq	WO9737005	Chemokines are a family of	Chemokines are a family of Chemokine activities can be Immune disorders	Immune disorders
Rantes	Accession		related small, secreted proteins	related small, secreted proteins determined using assays known in	
	W38129		involved in biological processes	involved in biological processes the art: Methods in Molecular	
			ranging from hematopoiesis,	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine	
			angiogenesis, and leukocyte	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	
			trafficking. Members of this	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	
			family are involved in a similarly	family are involved in a similarly Power. @ Humana Press Inc.,	
			diverse range of pathologies Totowa, NJ	Totowa, NJ	1 314
-			including inflammation, allergy,		
			tissue rejection, viral infection,		
	_		and tumor biology. The		,
			chemokines exert their effects by		
			acting on a family of seven		
			transmembrane G-protein-		
			coupled receptors. Over 40		•
			human chemokines have been		
			described, which bind to ~ 17		
			receptors thus far identified.		

Preferred Indication Y	Immune disorders																	
Exemplary Activity Assay	Chemokines are a family of Chemokine activities can be Immune disorders	related small, secreted proteins determined using assays known in	involved in biological processes the art: Methods in Molecular	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	family are involved in a similarly Power. Humana Press Inc.,	Totowa, NJ										
Biological Activity	Chemokines are a family of	related small, secreted proteins	involved in biological processes	ranging from hematopoiesis,	angiogenesis, and leukocyte	trafficking. Members of this	family are involved in a similarly	diverse range of pathologies Totowa, NJ	including inflammation, allergy,	tissue rejection, viral infection,	and tumor biology. The	chemokines exert their effects by	acting on a family of seven	transmembrane G-protein-	coupled receptors. Over 40	human chemokines have been	described, which bind to ~17	receptors thus far identified.
PCT/Patent Number	EP905240													,				
Exemplary Identifier	GeneSeq	Accession	Y05299															
Therapeutic Protein X	RANTES																	

Therapeutic	Exemplary	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Protein X	Identifier				
MCP-1a	GeneSeq	WO9509232	Chemokines are a family of	Chemokines are a family of Chemokine activities can be Immune disorders	Immune disorders
	Accession R73914		related small, secreted proteins	related small, secreted proteins determined using assays known in	
			involved in biological processes	involved in biological processes the art: Methods in Molecular	
			ranging from hematopoiesis,	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine	
			angiogenesis, and leukocyte	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	
			trafficking. Members of this	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	
			family are involved in a similarly	family are involved in a similarly Power. Humana Press Inc.,	
			diverse range of pathologies Totowa, NJ	Totowa, NJ	
			including inflammation, allergy,		
			tissue rejection, viral infection,		
			and tumor biology. The		
			chemokines exert their effects by		
			acting on a family of seven		
			transmembrane G-protein-		
			coupled receptors. Over 40		
			human chemokines have been		
			described, which bind to ~17		
			receptors thus far identified.		

			_				_				_					_		
Preferred Indication Y	Immune disorders							_										
Exemplary Activity Assay	Chemokines are a family of Chemokine activities can be Immune disorders	related small, secreted proteins determined using assays known in	involved in biological processes the art: Methods in Molecular	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	family are involved in a similarly Power. Humana Press Inc.,	Totowa, NJ										
Biological Activity	Chemokines are a family of	related small, secreted proteins	involved in biological processes	ranging from hematopoiesis,	angiogenesis, and leukocyte	trafficking. Members of this	family are involved in a similarly	diverse range of pathologies Totowa, NJ	including inflammation, allergy,	tissue rejection, viral infection,	and tumor biology. The	chemokines exert their effects by	acting on a family of seven	transmembrane G-protein-	coupled receptors. Over 40	human chemokines have been	described, which bind to ~17	receptors thus far identified.
PCT/Patent Number	WO9929728																	
Exemplary Identifier	GeneSeq	Accession	Y26176															
Therapeutic Protein X	MCP-1b								-									

Therapeutic	Exemplary	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Protein X	Identifier				
MCP-1 receptor	GeneSeq	WO9519436	Chemokines are a family of	Chemokines are a family of Chemokine activities can be Soluble MCP-1 Receptor	Soluble MCP-1 Receptor
	Accession R79165		related small, secreted proteins	related small, secreted proteins determined using assays known in polypeptides may be useful for	polypeptides may be useful for
			involved in biological processes	involved in biological processes the art: Methods in Molecular inhibiting chemokine activities	inhibiting chemokine activities
			ranging from hematopoiesis,	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine and viral infection.	and viral infection.
			angiogenesis, and leukocyte	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	
			trafficking. Members of this	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	
			family are involved in a similarly	family are involved in a similarly Power. © Humana Press Inc.,	
			diverse range of pathologies Totowa, NJ	Totowa, NJ	
			including inflammation, allergy,		
			tissue rejection, viral infection,		
_			and tumor biology. The		
			chemokines exert their effects by		
			acting on a family of seven		
			transmembrane G-protein-		
			coupled receptors. Over 40		
			human chemokines have been		
			described, which bind to ~17		
			receptors thus far identified.		

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Preferred Indication Y	Immune disorders																	
Exemplary Activity Assay	Chemokines are a family of Chemokine activities can be Immune disorders	related small, secreted proteins determined using assays known in	involved in biological processes the art: Methods in Molecular	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	family are involved in a similarly Power. @ Humana Press Inc.,	Totowa, NJ										
Biological Activity	Chemokines are a family of	related small, secreted proteins	involved in biological processes	ranging from hematopoiesis,	angiogenesis, and leukocyte	trafficking. Members of this	family are involved in a similarly	diverse range of pathologies Totowa, NJ	including inflammation, allergy,	tissue rejection, viral infection,	and tumor biology. The	chemokines exert their effects by	acting on a family of seven	transmembrane G-protein-	coupled receptors. Over 40	human chemokines have been	described, which bind to ~17	receptors thus far identified.
PCT/Patent Number	WO9509232					•												
Exemplary Identifier	GeneSeq	Accession R73915																
Therapeutic Protein X	MCP-3										•							

Therapeutic	Exemplary	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Protein X	Identifier				
MCP-4 receptor	GeneSeq	WO9809171	Chemokines are a family of	Chemokines are a family of Chemokine activities can be Soluble MCP-4 Receptor	Soluble MCP-4 Receptor
	Accession		related small, secreted proteins	related small, secreted proteins determined using assays known in polypeptides may be useful for	polypeptides may be useful for
	W56689		involved in biological processes	involved in biological processes the art: Methods in Molecular inhibiting chemokine activities	inhibiting chemokine activities
			ranging from hematopoiesis,	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine and viral infection.	and viral infection.
			angiogenesis, and leukocyte	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	
			trafficking. Members of this	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	
			family are involved in a similarly	family are involved in a similarly Power. Humana Press Inc.,	
			diverse range of pathologies Totowa, NJ	Totowa, NJ	
			including inflammation, allergy,		
			tissue rejection, viral infection,		
			and tumor biology. The		
			chemokines exert their effects by		
_			acting on a family of seven		
			transmembrane G-protein-		
			coupled receptors. Over 40		
			human chemokines have been		
			described, which bind to ~17		
			receptors thus far identified.		

Preferred Indication Y	oluble RANTES Receptor	olypeptides may be useful for	hibiting chemokine activities	nd viral infection.		ř												
Exemplary Activity Assay	Chemokines are a family of Chemokine activities can be Soluble RANTES Receptor	related small, secreted proteins determined using assays known in polypeptides may be useful for	involved in biological processes the art. Methods in Molecular inhibiting chemokine activities	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine and viral infection.	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	family are involved in a similarly Power. © Humana Press Inc.,	Totowa, NJ										
Biological Activity	Chemokines are a family of	related small, secreted proteins	involved in biological processes	ranging from hematopoiesis,	angiogenesis, and leukocyte	trafficking. Members of this	family are involved in a similarly	diverse range of pathologies Totowa, NJ	including inflammation, allergy,	tissue rejection, viral infection,	and tumor biology. The	chemokines exert their effects by	acting on a family of seven	transmembrane G-protein-	coupled receptors. Over 40	human chemokines have been	described, which bind to ~17	receptors thus far identified.
PCT/Patent Number	US5652133																	
Exemplary Identifier	GeneSeq	Accession	W26588															
Therapeutic Protein X	RANTES	receptor																

Therapeutic	Exemplary	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Protein X	Identifier				
CCR5 variant	GeneSeq	WO9854317	Chemokines are a family of	Chemokines are a family of Chemokine activities can be Soluble CCR5 polypeptides	Soluble CCR5 polypeptides
	Accession		related small, secreted proteins	related small, secreted proteins determined using assays known in may be useful for inhibiting	may be useful for inhibiting
	W88238		involved in biological processes	involved in biological processes the art: Methods in Molecular chemokine activities and viral	chemokine activities and viral
			ranging from hematopoiesis,	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine infection.	infection.
			angiogenesis, and leukocyte	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	
			trafficking. Members of this	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	
			family are involved in a similarly	family are involved in a similarly Power. © Humana Press Inc.,	
			diverse range of pathologies Totowa, NJ	Totowa, NJ	
			including inflammation, allergy,		
			tissue rejection, viral infection,		
			and tumor biology. The		
			chemokines exert their effects by		
			acting on a family of seven		
			transmembrane G-protein-	-	
			coupled receptors. Over 40		
•			human chemokines have been		
			described, which bind to ~17		
			receptors thus far identified.		

Therapeutic		PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Protein X	Identifier				
CCR7	GeneSeq	US6153441	Chemokines are a family of	Chemokines are a family of Chemokine activities can be Soluble CCR7 polypeptides	Soluble CCR7 polypeptides
_	Accession B50859		related small, secreted proteins	related small, secreted proteins determined using assays known in may be useful for inhibiting	may be useful for inhibiting
			involved in biological processes	involved in biological processes the art: Methods in Molecular chemokine activities and viral	chemokine activities and viral
			ranging from hematopoiesis,	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine infection.	infection.
****			angiogenesis, and leukocyte	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	
			trafficking. Members of this	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	
_			family are involved in a similarly	family are involved in a similarly Power. Humana Press Inc.,	
			diverse range of pathologies Totowa, NJ	Totowa, NJ	
			including inflammation, allergy,		
			tissue rejection, viral infection,		
			and tumor biology. The		
			chemokines exert their effects by		
			acting on a family of seven		
			transmembrane G-protein-		
			coupled receptors. Over 40		
			human chemokines have been		
			described, which bind to ~17		
			receptors thus far identified.		

Preferred Indication Y	Immune disorders																	
Exemplary Activity Assay	Chemokines are a family of Chemokine activities can be Immune disorders	related small, secreted proteins determined using assays known in	nvolved in biological processes the art: Methods in Molecular	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	family are involved in a similarly Power. Humana Press Inc.,	Totowa, NJ										
Biological Activity	Chemokines are a family of	related small, secreted proteins	involved in biological processes	ranging from hematopoiesis,	angiogenesis, and leukocyte	trafficking. Members of this	family are involved in a similarly	diverse range of pathologies Totowa, NJ	including inflammation, allergy,	tissue rejection, viral infection,	and tumor biology. The	chemokines exert their effects by	acting on a family of seven	transmembrane G-protein-	coupled receptors. Over 40	human chemokines have been	described, which bind to ~17	receptors thus far identified.
PCT/Patent Number	WO9727299																	
Exemplary Identifier	GeneSeq	Accession	W23345															
Therapeutic Protein X	CXC3											_			-			

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
	GeneSeq Accession W10099	1	Chemokines are a family of Chemokin related small, secreted proteins determined involved in biological processes the art: I ranging from hematopoiesis, Biology, 20 angiogenesis, and leukocyte Protocols. Itafficking. Members of this Proudfoot, family are involved in a similarly Power. © diverse range of pathologies Totowa, NJ including inflammation, allergy, tissue rejection, viral infection, and tumor biology. The chemokines exert their effects by acting on a family of seven transmembrane G-protein-coupled receptors. Over 40 human chemokines have been described, which bind to ~17 receptors flus far identified.	Chemokines are a family of Chemokine activities can be related small, secreted proteins determined using assays known in involved in biological processes the art: Methods in Molecular ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine angiogenesis, and leukocyte Protocols. Edited by: A.E.I. trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A. family are involved in a similarly Power. © Humana Press Inc., diverse range of pathologies Totowa, NJ including inflammation, allergy, tissue rejection, viral infection, and tumor biology. The chemokines exert their effects by acting on a family of seven transmembrane G-protein-coupled receptors. Over 40 human chemokines have been described, which bind to ~17 receptors thus far identified.	Immune disorders
Neurotactin	GeneSeq Accessions Y77537, W34307, Y53259, and Y77539	US6013257 WO9742224	Neurotactin may play a role in chemotactic leukocyte migration and brain inflammation processes.	Neurotactin may play a role in Chemotactic leukocyte migration Immune disorders chemotactic leukocyte migration assays are known in the art, for and brain inflammation example: J. Immunol. Methods 33, processes. ((1980)); Nature 1997 Jun 5;387(6633):611-7.	Immune disorders

Preferred Indication Y	be Immune disorders in lar lar A. A.	be Immune disorders in Inc. A.
Exemplary Activity Assay		Chemokine activities can determined using assays known the art: Methods in Molecu Biology, 2000, vol. 138: Chemok Protocols. Edited by: A.F. Proudfoot, T.N.C. Wells, and C. Power. © Humana Press In Totowa, NJ
Biological Activity	Chemokines are a family of Chemokine activities can related small, secreted proteins involved in biological processes the art. Methods in Molec ranging from hematopoiesis, Biology, 2000, vol. 138. Chemolangiogenesis, and leukocyte Protocols. Edited by: A. trafficking. Members of this Proudfoot, T.N.C. Wells, and Cfamily are involved in a similarly Power. © Humana Press I diverse range of pathologies Totowa, NJ including inflammation, allergy, tissue rejection, viral infection, and tumor biology. The chemokines exert their effects by acting on a family of seven transmembrane G-protein-coupled receptors. Over 40 human chemokines have been described, which bind to ~17 receptors thus far identified.	Chemokines are a family of related small, secreted proteins involved in biological processes ranging from hematopoiesis, angiogenesis, and leukocyte trafficking. Members of this family are involved in a similarly diverse range of pathologies including inflammation, allergy, tissue rejection, viral infection, and tumor biology. The chemokines exert their effects by acting on a family of seven transmembrane G
PCT/Patent Number	US6153441	WO0073320
Exemplary Identifier	GeneSeq Accession B50860	GeneSeq Accession B50052
Therapeutic Protein X	Human CK beta-9	Lymphotactin

Preferred Indication Y	Immune disorders	Immune disorders
Exemplary Activity Assay	Chemokine activities can be determined using assays known in the art: Methods in Molecular Biology, 2000, vol. 138: Chemokine Protocols. Edited by: A.E.I. Proudfoot, T.N.C. Wells, and C.A. Power. © Humana Press Inc., Totowa, NJ	Chemokine activities can be determined using assays known in the art: Methods in Molecular Biology, 2000, vol. 138: Chemokine Protocols. Edited by: A.E.I. Proudfoot, T.N.C. Wells, and C.A. Power. © Humana Press Inc., Totowa, NJ
Biological Activity	Chemokines are a family of related small, secreted proteins involved in biological processes ranging from hematopoiesis, angiogenesis, and leukocyte trafficking. Members of this family are involved in a similarly diverse range of pathologies including inflammation, allergy, tissue rejection, viral infection, and tumor biology. The chemokines exert their effects by acting on a family of seven reasonable and the chemokines of the chemokines exert their effects by acting on a family of seven reasonable and the chemokines of the che	Chemokines are a family of related small, secreted proteins involved in biological processes ranging from hematopoiesis, angiogenesis, and leukocyte trafficking. Members of this family are involved in a similarly diverse range of pathologies including inflammation, allergy, tissue rejection, viral infection, and tumor biology. The chemokines exert their effects by acting on a family of seven transmembrane G
PCT/Patent Number	WO9801557	WO9801557
Exemplary Identifier	GeneSeq Accession W44398	GeneSeq Accession W44399
Therapeutic Protein X	MIP-3 alpha	MIP-3 beta

Preferred Indication Y	in lar	be Hematopoietic growth factors in lar lar. I. A. A.	Hematopoletic growth factors
Exemplary Activity Assay	Chemokine activities can be determined using assays known in the art: Methods in Molecular Biology, 2000, vol. 138: Chemokine Protocols. Edited by: A.E.I. Proudfoot, T.N.C. Wells, and C.A. Power. © Humana Press Inc., Totowa, NJ	using assays known tethods in Molecu 00, vol. 138: Chemoki Edited by: A.E F.N.C. Wells, and C. Humana Press In	Thrombopoietin is involved in Thrombopoietin (TPO) can be Hematopoietic growth factors the regulation of the growth and assayed to determine regulation of growth and differentiation of megakaryocytes and precursors megakaryocytes. Mol Cell Biol thereof. 2001 Apr;21(8):2659-70; Exp Hematol 2001 Jan;29(1):51-8 and within.
Biological Activity	Chemokines are a family of related small, secreted proteins involved in biological processes ranging from hematopoiesis, angiogenesis, and leukocyte trafficking. Members of this family are involved in a similarly diverse range of pathologies including inflammation, allergy, tissue rejection, viral infection, and tumor biology. The chemokines exert their effects by acting on a family of seven transmembrane G	Chemokines are a family of Chemokine related small, secreted proteins determined u involved in biological processes the art: Me ranging from hematopoiesis, Biology, 2000 angiogenesis, and leukocyte Protocols. trafficking. Members of this Proudfoot, T. family are involved in a similarly Power. © I diverse range of pathologies Totowa, NJ including inflammation, allergy, tissue rejection, viral infection, and tumor biology. The chemokines exert their effects by acting on a family of seven transmembrane G	Thrombopoietin is involved in the regulation of the growth and differentiation of megakaryocytes and precursors thereof.
PCT/Patent Number	WO9504158	W09104274	W09521920
Exemplary Identifier	GeneSeq Accession R70798	GeneSeq Accession R11553	GeneSeq Accession R79905
Therapeutic Protein X	MIP-Gamma	Stem Cell Inhibitory Factor	thrombopoietin

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Preferred Indication Y	be Hematopoietic growth factors in lar lare	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as anti-angiogenic agents, and may be applicable for cancer	of Cancer; melenoma be in 92	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Antagonists may be useful as anti-angiogenic agents, and may be applicable for cancer
Exemplary Activity Assay	activities can using assays known fethods in Molecu 00, vol. 138: Chemok Edited by: A.E. F.N.C. Wells, and C Humana Press In	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	Tumor suppressor activity melanoma inhibiting protein can determined using assays known the art: Matzuk et al., Nature 19 Nov 26;360(6402):313-9.	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.
Biological Activity	c-kit ligand is thought to Chemokine stimulate the proliferation of determined mast cells, and is able to the art: M augment the proliferation of both Biology, 200 myeloid and lymphoid Protocols. hematopoietic progenitors in Proudfoot, I bone marrow culture. C-kit Power. © ligand is also thought to act Totowa, NJ synergistically with other cytokines.	Vascular Endothelial Growth Factor	Melanoma inhibiting protein has melanoma-inhibiting activity and can be used to treat cancer (melanoma, glioblastoma, neuroblastoma, small cell lung cancer, neuroectodermal tumours) or as an immunosuppressant (it inhibits IL-2 or phytohaemagglutinin induced proliferation of peripheral blood lymphocytes.	Vascular Endothelial Growth Factor
PCT/Patent Number	EP992579 and EP676470	WO0066736	WO9503328	EP399816
Exemplary Identifier	GeneSeq Accession Y53284, R83978 and R83977	GeneSeq Accession B48653	GeneSeq Accession R69811	GeneSeq Accession R08120
Therapeutic Protein X	c-kit ligand; SCF, Mast cell growth factor; MGF; Fibrosarcomaderived stem cell factor	Platelet derived growth factor	Melanoma inhibiting protein	Glioma-derived growth factor

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Platelet derived	GeneSeq Accession R84759	EP682110	Vascular Endothelial Growth	VEGF activity can be determined	Promotion of growth and
precursor A		,	Topan	as those disclosed in International	vascular endothelial cells.
				Publication No. WO0045835, for	Antagonists may be useful as
				example,	anti-angiogenic agents, and
		0.000			Illay be applicable for calicel
Platelet derived	GeneSeq	EP682110	Vascular Endothelial Growth	VEGF activity can be determined	Promotion of growth and
growth factor	Accession R84760		Factor	using assays known in the art, such	proliferation of cells, such as
precursor B				as those disclosed in International	vascular endothelial cells.
		-		Publication No. WO0045835, for	Antagonists may be useful as
				example.	anti-angiogenic agents, and
					may be applicable for cancer
Platelet derived	GeneSeq	EP282317	Vascular Endothelial Growth	VEGF activity can be determined	Promotion of growth and
growth factor	Accessions		Factor	using assays known in the art, such	proliferation of cells, such as
Bv-sis	P80595 and			as those disclosed in International	vascular endothelial cells.
	P80596			Publication No. WO0045835, for	Antagonists may be useful as
				example.	anti-angiogenic agents, and
					may be applicable for cancer
Placental	GeneSeq	WO9206194	Vascular Endothelial Growth	VEGF activity can be determined	Promotion of growth and
Growth Factor	Accessions		Factor	using assays known in the art, such	proliferation of cells, such as
	R23059 and			as those disclosed in International	vascular endothelial cells.
	R23060			Publication No. WO0045835, for	Antagonists may be useful as
				example.	anti-angiogenic agents, and
					may be applicable for cancer
Placental	GeneSeq	DE19748734	Vascular Endothelial Growth	VEGF activity can be determined	Promotion of growth and
Growth Factor-	Accession		Factor	using assays known in the art, such	proliferation of cells, such as
7	X08289			as those disclosed in International	vascular endothelial cells.
				Publication No. WO0045835, for	Antagonists may be useful as
				example.	anti-angiogenic agents, and
					may be applicable for cancer

Preferred Indication Y	Thrombocytopenia, cancer	Thrombocytopenia, cancer of of iol	be Thrombocytopenia, cancer of of iol	be Thrombocytopenia, cancer of of of iol	be Thrombocytopenia, cancer of of viol
Exemplary Activity Assay	can be ation of ation of Cell Biol 70; Exp 51-8 and	Thrombopoietin (TPO) can- assayed to determine regulation growth and differentiation megakaryocytes. Mol Cell B 2001 Apr;21(8):2659-70; E Hematol 2001 Jan;29(1):51-8 a within.	Thrombopoietin is involved in Thrombopoietin (TPO) can be the regulation of the growth and assayed to determine regulation of differentiation of growth and differentiation of megakaryocytes and precursors megakaryocytes. Mol Cell Biol thereof. 2001 Apr;21(8):2659-70; Exp Hematol 2001 Jan;29(1):51-8 and within.	Thrombopoietin is involved in Thrombopoietin (TPO) can be the regulation of the growth and assayed to determine regulation of differentiation of growth and differentiation of megakaryocytes and precursors megakaryocytes. Mol Cell Biol thereof. 2001 Apr;21(8):2659-70; Exp Hematol 2001 Jan;29(1):51-8 and within.	Thrombopoietin is involved in Thrombopoietin (TPO) can be the regulation of the growth and assayed to determine regulation of differentiation of growth and differentiation of megakaryocytes and precursors megakaryocytes. Mol Cell Biol thereof. Hematol 2001 Jan;29(1):51-8 and within.
Biological Activity	Thrombopoietin is involved in Thrombopoietin (TPO) the regulation of the growth and assayed to determine regularies of growth and differentian megakaryocytes and precursors megakaryocytes. Molthereof. Hematol 2001 Jan;29(1):: within.	Thrombopoietin is involved in the regulation of the growth and differentiation of megakaryocytes and precursors thereof.	Thrombopoietin is involved in the regulation of the growth and differentiation of megakaryocytes and precursors thereof.	Thrombopoietin is involved in the regulation of the growth and differentiation of megakaryocytes and precursors thereof.	Thrombopoletin is involved in the regulation of the growth and differentiation of megakaryocytes and precursors thereof.
PCT/Patent Number	WO0000612	WO0000612	WO0000612	WO0000612	WO0000612
Exemplary Identifier	GeneSeq Accession Y77244	GeneSeq Accession Y77255	GeneSeq Accession Y77262	GeneSeq Accession Y77267	GeneSeq Accession Y77246
Therapeutic Protein X	Thrombopoletin derivative1	Thrombopoietin derivative2	Thrombopoietin derivative3	Thrombopoietin derivative4	Thrombopoietin derivative5

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Thrombopoietin derivative6	GeneSeq Accession Y77253	WO0000612	Thrombopoietin is involved in the regulation of the growth and differentiation of megakaryocytes and precursors thereof.	Thrombopoietin is involved in Thrombopoietin (TPO) can be Thrombocytopenia, cancer the regulation of the growth and assayed to determine regulation of differentiation of growth and differentiation of megakaryocytes and precursors megakaryocytes. Mol Cell Biol 2001 Apr;21(8):2659-70; Exp Hematol 2001 Jan;29(1):51-8 and within.	Thrombocytopenia, cancer
Thrombopoietin derivative7	GeneSeq Accession Y77256	WO0000612	Thrombopoietin is involved in the regulation of the growth and differentiation of megakaryocytes and precursors thereof.	Thrombopoietin is involved in Thrombopoietin (TPO) can be Thrombocytopenia, cancer the regulation of the growth and assayed to determine regulation of differentiation of growth and differentiation of megakaryocytes and precursors megakaryocytes. Mol Cell Biol 2001 Apr;21(8):2659-70; Exp Hematol 2001 Jan;29(1):51-8 and within.	Thrombocytopenia, cancer
Fractalkine	GeneSeq Accession Y53255	US6043086	Fractalkine is believed to play a role in chemotactic leukocyte migration and neurological disorders.	Fractalkine is believed to play a Fractalkine activity can be Immune disorders role in chemotactic leukocyte determined using Chemotactic migration and neurological leukocyte migration assays known in the art, for example: J. Immunol. Methods 33, ((1980)); Nature 1997 Jun 5;387(6633):611-7.	Immune disorders

Therapeutic	<u> </u>	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Protein X	1				
CXC3	GeneSeq	WO9727299	Chemokines are a family of	Chemokines are a family of Chemokine activities can be Immune disorders	Immune disorders
	Accession	•	related small, secreted proteins	related small, secreted proteins determined using assays known in	
	W23345		involved in biological processes	involved in biological processes the art: Methods in Molecular	
			ranging from hematopoiesis,	ranging from hematopoiesis, Biology, 2000, vol. 138: Chemokine	
			angiogenesis, and leukocyte	angiogenesis, and leukocyte Protocols. Edited by: A.E.I.	
			trafficking. Members of this	trafficking. Members of this Proudfoot, T.N.C. Wells, and C.A.	
			family are involved in a similarly	family are involved in a similarly Power. © Humana Press Inc.,	
			diverse range of pathologies Totowa, NJ	Totowa, NJ	
			including inflammation, allergy,		
			tissue rejection, viral infection,		
	_		and tumor biology. The		
			chemokines exert their effects by		
			acting on a family of seven		
			transmembrane G-protein-		
-			coupled receptors. Over 40		
			human chemokines have been		
			described, which bind to ~17		
			receptors thus far identified.		

Preferred Indication Y	be Soluble CCR7 polypeptides in may be useful for inhibiting lar chemokine activities and viral line infection. 3.1. A. (c.,	Neurological disorders, cancer	Neurological disorders, cancer	Neurological disorders, cancer	Neurological disorders, cancer
Exemplary Activity Assay	Chemokine activities can determined using assays known the art: Methods in Molecu Biology, 2000, vol. 138: Chemok Protocols. Edited by: A.E Proudfoot, T.N.C. Wells, and C. Power. © Humana Press In Totowa, NJ	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266)	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266)	Neurotrophins regulate neuronal Trk tyrosine kinase activation assays cell survival and synaptic known in the art can be used to assay for neurotrophin activity, for example, Proc Natl Acad Sci U S A 2001 Mar 13;98(6):3555-3560.	Neurotrophins regulate neuronal Trk tyrosine kinase activation assays Neurological disorders, cancer cell survival and synaptic known in the art can be used to assay for neurotrophin activity, for example, Proc Natl Acad Sci U S A 2001 Mar 13;98(6):3555-3560.
Biological Activity	Chemokines are a family of Chemokine related small, secreted proteins involved in biological processes the art: Me ranging from hematopoiesis, Biology, 2000 angiogenesis, and leukocyte Protocols. trafficking. Members of this Proudfoot, T family are involved in a similarly Power. © diverse range of pathologies Totowa, NJ including inflammation, allergy, tissue rejection, viral infection, and tumor biology. The chemokines exert their effects by acting on a family of seven transmembrane G-protein-coupled receptors. Over 40 human chemokines have been described, which bind to ~17 receptors thus far identified.	Nerve Growth Factor	Nerve Growth Factor	Neurotrophins regulate neuronal cell survival and synaptic plasticity.	Neurotrophins regulate neuronal cell survival and synaptic plasticity.
PCT/Patent Number	US6153441	EP414151	EP859056	WO9821234	WO9325684
Exemplary Identifier	GeneSeq Accession B50859	GeneSeq Accession R11474	GeneSeq Accession W69725	GeneSeq Accession W48889	GeneSeq Accession R47100
Therapeutic Protein X	CCR7	Nerve Growth Factor-beta	Nerve Growth Factor-beta2	Neurotrophin-3	Neurotrophin-4

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Neurotrophin- 4a	GeneSeq Accession R47101	WO9325684	Neurotrophins regulate neuronal	Neurotrophins regulate neuronal Trk tyrosine kinase activation assays Neurological disorders, cancer cell survival and synaptic known in the art can be used to	Neurological disorders, cancer
			plasticity.	assay for neurotrophin activity, for	
				2001 Mar 13;98(6):3555-3560.	
				13;98(6):3555-3560	
Neurotrophin-	GeneSeq	W09325684	Neurotrophins regulate neuronal	Neurotrophins regulate neuronal Trk tyrosine kinase activation assays Neurological disorders, cancer	Neurological disorders, cancer
	Accession R47102		vival and	synaptic known in the art can be used to	
			plasticity.	assay for neurotrophin activity, for	
•			tyrosine kinases.	example, Proc Natl Acad Sci U S A	
				2001 Mar 13;98(6):3555-3560.	
Neurotrophin-	GeneSeq	WO9325684	Neurotrophins regulate neuronal	Neurotrophins regulate neuronal Trk tyrosine kinase activation assays Neurological disorders, cancer	Neurological disorders, cancer
	Accession R47103		cell survival and synaptic	synaptic known in the art can be used to	
			plasticity.	assay for neurotrophin activity, for	
				example, Proc Natl Acad Sci U S A	
				2001 Mar 13;98(6):3555-3560.	
Neurotrophin-	GeneSeq	W09325684	Neurotrophins regulate neuronal	Neurotrophins regulate neuronal Trk tyrosine kinase activation assays Neurological disorders, cancer	Neurological disorders, cancer
	Accession R47104		cell survival and synaptic	synaptic known in the art can be used to	
			plasticity.	assay for neurotrophin activity, for	
				example, Proc Natl Acad Sci U S A	
				2001 Mar 13;98(6):3555-3560.	
Platelet-Derived	GeneSeq	US5219739	Vascular Endothelial Growth	VEGF activity can be determined	Promotion of growth and
Growth Factor	Accession R38918		Factor	using assays known in the art, such	proliferation of cells, such as
A chain				as those disclosed in International	vascular endothelial cells.
				Publication No. WO0045835, for	Hematopoietic and immune
				example.	disorders. Antagonists may be
					useful as anti-angiogenic
					agents, and may be applicable
					for cancer

tion Y	and such as ells. mune s may be nic	immune	immune	Immune	system	system
Preferred Indication Y	Promotion of growth and proliferation of cells, such as vascular endothelial cells. Hematopoietic and immune disorders. Antagonists may be useful as anti-angiogenic agents, and may be applicable for cancer	Hematopoietic, disorders, cancer	Hematopoietic, disorders, cancer	Antiinflammatory. disorders, cancer	and Reproductive by disorders, cancer. hods nple, Ann 2-33,	and Reproductive by disorders, cancer. hods apple, Ann A.
Exemplary Activity Assay	VEGF activity can be determined using assays known in the art, such as those disclosed in International Publication No. WO0045835, for example.	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266)	Proliferation assay using NR6R-3T3 cells (Rizzino 1988 Cancer Res. 48: 4266)	Chemotactic for T lymphocytes. Chemotactic leukocyte migration Antiinflammatory. May play a role in T-cell assays are known in the art, for disorders, cancer development. Thought to bind example: J. Immunol. Methods 33, ((1980))	Immune cell proliferation and Reproductive suppression of apoptosis by disorders, cancer. prolactin can be assayed by methods well-known in the art, for example, Buckley, AR and Buckley, DJ, Ann N Y Acad Sci 2000; 917:522-33, and within.	
Biological Activity	Vascular Endothelial Growth Factor	Stromal Growth Factor	Stromal Growth Factor	Chemotactic for T lymphocytes. May play a role in T-cell development. Thought to bind CCR8 and CCR4	Prolactin is involved in immune cell proliferation cell proliferation and apoptosis. suppression of apoptosis prolactin can be assayed by metl-known in the art, for exan Buckley, AR and Buckley DJ, N Y Acad Sci 2000; 917:522 and within.	Prolactin is involved in immune cell proliferation cell proliferation and apoptosis. suppression of apoptosis prolactin can be assayed by met well-known in the art, for exan Buckley, AR and Buckley DJ, N Y Acad Sci 2000; 917:522 and within.
PCT/Patent Number	US5219739	WO9948528	CA2117953	W09711969	W09521625	USS955346
Exemplary Identifier	GeneSeq Accession R38919	GeneSeq Accession Y39995	GeneSeq Accession R75420	GeneSeq Accession W14917	GeneSeq Accession R78691	GeneSeq Accession Y31764
Therapeutic Protein X	Platelet-Derived Growth Factor B chain	Stromal Derived Factor-1 alpha	Stromal Derived Factor-1 beta	Tarc	Prolactin	Prolactin2

	8	В	50	, r
ication Y	system	system	er er	disorders,
Preferred Indication Y	roductive ders, cancer	roductive ders, cancer	hypertension, canc	inflammatory disorders immunologic disorders, cancer
<u>-</u>	Rep	Rep	diat hyper	infla immu
Exemplary Activity Assay	FSH stimulates secretion of FSH activities can be determined Reproductive interleukin-1 by cells isolated using assays known in the art: J disorders, cancer from women in the follicular Gend Specif Med 1999 Nov-Dec;2(6):30-4; Mol Cell Endocrinol. 1997 Nov 15;134(2):109-18.	FSH stimulates secretion of FSH activities can be determined Reproductive interleukin-1 by cells isolated using assays known in the art: J disorders, cancer from women in the follicular Gend Specif Med 1999 Nov-Dec;2(6):30-4 ; Mol Cell Endocrinol. 1997 Nov-15;134(2):109-18.	Substance P is associated with Immunoregulation and bone marrow diabetes m cell proliferation by substance P can hypertension, cancer be assayed by methods well-known in the art, for example, Lai et al. Proc Natl Acad Sci USA 2001 Mar 27; 98(7):3970-5; Jallat-Daloz et al. Allergy Asthma Proc 2001 Jan-Feb; 22(1):17-23; Kahler et al. Exp Lung Res 2001 Jan-Feb; 27(1):25-46; and Adamus MA and Dabrowski ZJ. J Cell Biochem 2001; 81(3)499-506.	Oxytocin is involved in the Oxytocin and prostaglandin E(2) induction of prostaglandin (E2) release and Oxytocin (Ca2+) release, as well as an increased increase can be assayed by methods amount of calcium release by well-known in the art, for example, smooth muscle cells. Pavan et al., AM J Obset Gynecol 2000 Jul; 183(1):76-82 and Holda et al., Cell Calcium 1996 Jul;20(1):43-51.
	FSH usin Gen Gen Dec End End 15;1	FSH usin Gen Dec End End 15:1	real cell be a in the Proc 27; 9 Aller 22(1 Res Adau Cell	Oxy rele: incre well Pavs 2000 al., 0
Biological Activity	FSH stimulates secretion of interleukin-1 by cells isolated from women in the follicular phase	stimulates eukin-1 by women in	Substance P is associated with immunoregulation.	Oxytocin is involved in the induction of prostaglandin (E2) release, as well as an increased amount of calcium release by smooth muscle cells.
	FSH interl from phase	FSH interle from phase	Subsitum	Oxy indu reles amo smo
PCT/Patent Number	EP974359	EP974359	WO0054053	WO0053755
Exemplary Identifier	GeneSeq Accession Y54160	GeneSeq Accession Y54161	GeneSeq Accession B23027	GeneSeq Accessions B24085 and B24086
Therapeutic Protein X	Follicle stimulating hormone Alpha subunit	Follicle stimulating hormone Beta subunit	Substance P (tachykinin)	Oxytocin (Neurophysin I)

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dication Y	disorders,	orders, cance			disorders,	orders, cance.										disorders,	orders, cance.									
Preferred Indication Y	can be inflammatory	munologic dis			flammatory	munologic dis										flammatory	munologic dis									
	e in	<u> </u>	=		e in	n im		<u>4</u>	•	r:	- XX					e ini	u iii	п	4	•	ri	ઝ				_
Assay	can b	s known i doer Rem	idori ivegi		can b	s known i	tal., i	rferons: ,	mens et al	gton, D.C	Orencole &	e 1, 14-20.				can b	s known i	tal., i	rferons: ,	mens et al	gton, D.C	Orencole &	e 1, 14-20.			
Exemplary Activity Assay	activity	ing assay: amrle Fr	ampre, Er):13-17.		activity	ing assay:	thews	and Inte	roach, Cle	s, Washir	.225; and) Cytokin				activity	ing assay	thews e	and Inte	roach, Cle	s, Washir	.225; and	9) Cytokin			
Exemplar	Vasopressin	determined us	1996 Mar;30(1		group of Interleukin activity can be inflammatory	determined us	the art: Mat	Lymphokines	Practical Appr	eds, IRL Pres	1987, pp. 221-	Dinarello (1989				Interleukin	determined us	the art: Mat	Lymphokines	Practical Appr	eds, IRL Pres	1987, pp. 221-	Dinarello (1989			
Activity	eved to have a	action on the	n of the		a group of	cytokines	lymphocytes,	nacrophages.	ns include	iferation of	g., T helper	sinophils, and	emotaxis of	lymphocytes,	interferons.	a group of	cytokines	lymphocytes,	nacrophages.	ns include	iferation of	g., T helper	sinophils, and	emotaxis of	lymphocytes,	interrerons.
Biological Activity	Vasopressin is believed to have a Vasopressin	direct antidiuretic action on the determined using assays known in immunologic disorders, cancer kidney and it is thought to cause the art for example. Endoor Remit	vasoconstriction of the 1996 Mar;30(1):13-17.	peripheral vessels.	Interleukins are a	multifunctional cytokines determined using assays known in immunologic disorders, cancer	synthesized by lymphocytes, the art: Matthews et al., in	monocytes, and macrophages. Lymphokines and Interferons: A	Known functions include Practical Approach, Clemens et al.,	stimulating proliferation of eds, IRL Press, Washington, D.C.	immune cells (e.g., T helper 1987, pp. 221-225; and Orencole &	cells, B cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20.	lymphocytes), chemotaxis of	neutrophils and T lymphocytes,	and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be inflammatory	multifunctional cytokines determined using assays known in immunologic disorders, cancer	synthesized by lymphocytes, the art: Matthews et al., in	monocytes, and macrophages. Lymphokines and Interferons: A	Known functions include Practical Approach, Clemens et al.,	stimulating proliferation of eds, IRL Press, Washington, D.C.	immune cells (e.g., T helper 1987, pp. 221-225; and Orencole &	cells, B cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20.	lymphocytes), chemotaxis of	neutrophils and T lymphocytes,	and/or inhibition of interterons
PCT/Patent Number	NO0053755	0 1	, ,>_	1	EP165654	<u> </u>	S	<u> </u>	P	8	<u></u>	0	<u></u> -	Ħ	8	EP456332 I	<u> </u>	8	<u> </u>	<u> </u>	S	•=	3		H	2
Exemplary Identifier	GeneSeq	Accessions R24085 and	B24086		GeneSeq	Accession P60326					_					GeneSeq	Accession R14855									
Therapeutic Protein X	Vasopressin	(Neurophysin	Î		11-1											IL-1 mature										

Therapeutic Protein X II - 1 heta	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	ĕ
	Accession Y08322	CO1776COM	multifunctional cytokines determined using synthesized by lymphocytes, the art: Mat monocytes, and macrophages. Lymphokines Known functions include Practical Apprimulating proliferation of eds. IRL Presimmune cells (e.g., T helper 1987, pp. 221-cells, B cells, eosinophils, and Dinarello (1986 lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Orencole & cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	initammatory disorders, immunologic disorders, cancer
~ ~	GeneSeq Accessions P80382, P80383, P80384, and P80381	WO8806161	Interleukins are a group of Interleukin multifunctional cytokines determined u synthesized by lymphocytes, the art: Ma monocytes, and macrophages. <i>Lymphokines</i> Known functions include <i>Practical App</i> stimulating proliferation of eds, IRL Pre immune cells (e.g., T helper 1987, pp. 221 cells, B cells, eosinophils, and al (1989) J C lymphocytes), chemotaxis of 334. and/or inhibition of interferons.	rleukin activity can rmined using assays known art: Matthews et al., phokines and Interferons: tical Approach, Clemens et IRL Press, Washington, D 7, pp. 221-225; and Kitamura 1989) J Cell Physiol. 140 33	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.
I X	GeneSeq Accession P70615	WO8702990	Interleukins are a group of Interleukin activimultifunctional cytokines determined using assynthesized by lymphocytes, the art: Matthews monocytes, and macrophages. <i>Lymphokines and I</i> Known functions include <i>Practical Approach</i> , stimulating proliferation of eds, IRL Press, Waimmune cells (e.g., T helper 1987, pp. 221-225; cells, B cells, eosinophils, and Mostowski (1990) lymphocytes), chemotaxis of Methods 132,287-295 and/or inhibition of interferons.	ity can says known et al., merferons: Clemens et shington, D shington, D and Siegel J Immu	be inflammatory disorders, in immunologic disorders, cancer in A al., .C. &

$\overline{}$		
Preferred Indication Y	inflammatory disorders, immunologic disorders, cancer	inflammatory disorders, immunologic disorders, cancer
Exemplary Activity Assay	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Siegel & cells, B cells, eosinophils, and Mostowski (1990) J Immunol lymphocytes), chemotaxis of Methods 132,287-295. and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Orencole & cells, B cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20. Iymphocytes), chemotaxis of neutrophils and T lymphocytes,
Biological Activity	Interleukins are a group of Interleukin activi multifunctional cytokines determined using ass synthesized by lymphocytes, the art: Matthews monocytes, and macrophages. <i>Lymphokines and I</i> Known functions include <i>Practical Approach</i> , stimulating proliferation of eds, IRL Press, Was immune cells (e.g., T helper 1987, pp. 221-225; cells, B cells, eosinophils, and Mostowski (1990) lymphocytes), chemotaxis of Methods 132,287-295. and/or inhibition of interferons.	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
PCT/Patent Number	W09747744	EP324447
Exemplary Identifier	GeneSeq Accessions W52151, W52152, W52153, W52154, W52154, W52156, W52156, W52157, W52160, W52160, W52161, W52161, W52161, W52161, W52162,	GeneSeq Accession P90108
Therapeutic Protein X	IL-4 muteins	IL-1 alpha

Therapeutic	Exemplary	PCT/Patent Number	Biological Activity Exemplary Activity Assay Prefe	Preferred Indication 1
Protein X IL-3 variants	GeneSeq Accessions R38561, R38562, R38563, R38564, R38565, R38566, R38567, R38566, R38569, R38571, and R38571, and	WO9307171	Interleukins are a group of Interleukin activity can be inflammatory disorders, multifunctional cytokines determined using assays known in monocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells, B cells, eosinophils, and al (1989) J Cell Physiol. 140 323-lymphocytes), chemotaxis of 334.	ologic disorders, cancer
II-6	GeneSeq Accessions R45717 and R45718	WO9402512	Interleukins are a group of Interleukin activity can be inflammatory disorders Interleukins are a group of determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Aarden et al cells, B cells, eosinophils, and (1987) Eur. J. Immunol 17, 1411-lymphocytes), chemotaxis of 16.	nmatory disorders, nologic disorders, cancer
IL-13	GeneSeq Accession R48624	WO9404680	Interleukins are a group of Interleukin activity can be inflammatory disorders. Interleukins are a group of Interleukin activity can be inflammatory disorders. Interleukins are a group of Interleukin assays known immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. stimulating proliferation of eds, IRL Press, Washington, Methods immune cells (e.g., T helper 1987, pp. 221-225; and Boutelier et cells, eosinophils, and al (1995) J. Immunol. Methods lymphocytes), chemotaxis of 181,29. and/or inhibition of interferons.	mmatory disorders, nologic disorders, cancer

Therapeutic	Exemplary	PCT/Patent Number	Biological Activity Exemplary Activity Assay	Preferred Indication Y
Frotein X IL-4 mutein	GeneSed Accession R47182	DE4137333	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells, e.g., T helper 1987, pp. 221-225; and Siegel & cells, eosinophils, and Mostowski (1990) J Immunol lymphocytes), chemotaxis of Methods 132,287-295. and/or inhibition of interferons.	be inflammatory disorders, in immunologic disorders, cancer in A al., C. &
IL-4 mutein Y124X	GeneSeq Accession R47183	DE4137333	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Siegel & cells, eosinophils, and Mostowski (1990) J Immunol lymphocytes), chemotaxis of Methods 132,287-295.	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.
IL-4 mutein Y124G	GeneSeq Accession R47184	DE4137333	Interleukins are a group of Interleukin activity can be inflammatory disorders. Interleukins are a group of etermined using assays known in mmunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds. IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Siegel & cells, eosinophils, and Mostowski (1990) I Immunol lymphocytes), chemotaxis of Methods 132,287-295.	be inflammatory disorders, in immunologic disorders, cancer in A al., D.C.

Therapeutic	Exemplary	PCT/Patent Number	Biological Activity Exemplary Activity Assay Freienreu mucauon a
Protein X Human Interleukin-10 (precursor)	Identifier GeneSeq Accession R41664	WO9317698	Interleukins are a group of Interleukin activity can be inflammatory disorders, multifunctional cytokines determined using assays known in synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Thompsoncells, eosinophils, and Snipes et al (1991) J. Exp. Med. lymphocytes), chemotaxis of 173, 507-510.
Human Interleukin 10	GeneSeq Accession R42642	WO9318783-A	multifunctional cytokines determined using assays known in multifunctional cytokines determined using assays known in multifunctional cytokines determined using assays known in multifunctional cytokines, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A monocytes, and macrophages. Lymphokines and Interferons: A known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Thompsoncells, eosinophils, and Snipes et al (1991) J. Exp. Med. Iymphocytes), chemotaxis of 173,507-510.
Human interleukin-1 beta precursor.	GeneSeq Accession R42447	EP569042	Interleukins are a group of Interleukin activity can be inflammatory disorders, Interleukins are a group of Interleukin activity can be inflammatory disorders, Interleukins are a group of Interleukin assays known in immunologic disorders, cancer multifunctional cytokines, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Orencole & lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.

Thomosoufic	Exemplary	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Therapeunc Protein X	Identifier			of Interleukin activity can be	be inflammatory disorders,
Interleukin- 1alpha	GeneSeq Accession R45364	EP578278	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages.	Interleukins are a group of interpretation of the properties of the art: Matthews et al., in synthesized by lymphocytes, the art: Matthews et al., in macrophages. Lymphokines and Interferons: A	immunologic disorders, cancer
			Known functions include stimulating proliferation of	Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. stimulating proliferation of 1987, pp. 221-225; and Orencole &	
			cells, B cells, eosinophils, and lymphocytes), chemotaxis of	cells, B cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20. Ivanhocytes), chemotaxis of	
			neutrophils and T lymphocytes, and/or inhibition of interferons.	e 1.1. can be	inflammatory disorders,
MIRAP	GeneSeq	WO9117184	Interleukins are a group of multifunctional cytokines	Interleukins are a group of Interleukin activity can immunologic disorders, cancer multifunctional cytokines determined using assays known in immunologic disorders, cancer multifunctional cytokines	immunologic disorders, cancer
	Accession nithod		synthesized by lymphocytes, monocytes, and macrophages.	synthesized by lymphocytes, the art: Matunews of arr., and macrophages. Lymphokines and Interferons: A monocytes, and macrophages.	
			Known functions include	Known functions include Practical Approach, Councils Com-	
			immune cells (e.g., T helper 1987, pp. 221-225.	(1987, pp. 221-225.	
			cells, B cells, eosmopanis, and lymphocytes), chemotaxis of		
			neutrophils and T lymphocytes,		1
	Devone	JP04063595		a group of Interleukin activity can be inflammatory disorders, a group of Interleukin a sesays known in immunologic disorders, cancer	be inflammatory disorders, in immunologic disorders, cancer
numan interleukin-3	Accession R22813	<u>e</u>	multifunctional cytokines synthesized by lymphocytes	multifunctional cytokines declining and synthesized by lymphocytes, the art; Matthews et al., is synthesized by lymphocytes, the art; Matthews et al., is	
			monocytes, and macrophages.	monocytes, and macrophages. Lymphokines and interferons. A	
			stimulating proliferation o	stimulating proliferation of eds, IRL press, Washington, D.C. stimulating, proliferation of 1987 on 221-225; and Kitamura et	<u>. </u>
		,	immune cells (e.g., 1 listyce) cells, B cells, eosinophils, an	immune cells (e.g., 1 nerpel 1797, pp. 223-cells, essinophils, and al (1989) J Cell Physiol. 140 323-	
			lymphocytes), chemotaxis of 334,	of 334. s,	
			and/or inhibition of interferons.		

Preferred Indication Y	be inflammatory disorders,	immunologic disorders, cancer	be inflammatory disorders,		can be inflammatory disorders,	E V Li
Exemplary Activity Assay	of Interlenkin activity can be	Interleukins are a group of the art: Matthews et al., in synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A monocytes, and macrophages. Rown functions include Practical Approach, Clemens et al., Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. ets., T helper 1987, pp. 221-225. eells, eosinophils, and lymphocytes), chemotaxis of lymphocytes, chemotaxis of I lymphocytes,	Interleukin activity can be	multifunctional cytokines multifunctional cytokines are specifical cytokines and interpolations and macrophages. Rown functions include practical Approach, Clemens et al., Known functions include practical Approach, Clemens et al., Known functions include practical Approach, Clemens et al., Known functions include practical Approach, Clemens et al., Rown functions include 1987, pp. 221-225. immune cells (e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of hentrophils and T lymphocytes,	Interleukin activity	multifunctional cytokines determined using assets morning and the art: Matthews et al., in synthesized by lymphocytes, the art: Matthews et al., in synthesized by lymphocytes, and macrophages. Lymphokines and Interferons: A monocytes, and macrophages. Lymphokines and Interferons: A monocytes, and macrophages. Lymphokines and Interferons. Stimulating proliferation of eds. IRL Press, Washington, D.C. stimulating proliferation of eds. IRL Press, Washington, D.C. stimulating proliferation of 1987, pp. 221-225. Interferons: A proposition of interferons.
Biological Activity	300	Interleukins are a group of interferent are a group of interferent and multifunctional cytokines determined using synthesized by lymphocytes, the art: Matther monocytes, and macrophages. Lymphokines and Known functions include Practical Approach stimulating proliferation of eds, IRL Press, immune cells (e.g., T helper 1987, pp. 221-225. immune cells, eosinophils, and lymphocytes), chemotaxis of lymphocytes), chemotaxis of lymphocytes,	and/or inhibition of interferons.	Interleukins are a strong multifunctional cytokines determined using multifunctional cytokines the art: Matther synthesized by lymphocytes, the art: Matther monocytes, and macrophages. Lymphokines and Known functions include Practical Approach stimulating proliferation of eds, IRL Press, vimulating proliferation of eds, IRL Press, cells, B cells, eosinophils, and lymphocytes), chemotaxis of heartcohils and T lymphocytes,	and/or inhibition of interferons. Interleukins are a group of Interleukin	multifunctional cytokines determined using multifunctional by lymphocytes, the art: Matthe synthesized by lymphocytes, Lymphokines and macrophages. Lymphokines and Known functions include Practical Approach stimulating proliferation of eds. IRL Press, immune cells (e.g., T helper 1987, pp. 221-225. immune cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
ner Betont Number	_	EP533350		EP533350-	TD622240	
Ī	Exemplary 1	GeneSed Accession R33780		GeneSeq Accession R33781		GeneSeq Accession R33782
	Therapeutic	ICE 22 kD subunit.		ICE 20 kD subunit.		ICE 10 kD subunit.

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Human Interleukin-10 (precursor)	GeneSeq Accession R41664	WO9317698	Interleukins are a group of Interleukin multifunctional cytokines determined u synthesized by lymphocytes, the arr: Ms monocytes, and macrophages. <i>Lymphokines</i> Known functions include <i>Practical App</i> stimulating proliferation of eds, IRL Pre immune cells (e.g., T helper 1987, pp. 22. cells, B cells, eosinophils, and Snipes et al lymphocytes), chemotaxis of 173, 507-510 neutrophils and T lymphocytes,	activity can sing assays known itthews et al., and Interferons: proach, Clemens et iss, Washington, D 1-225; and Thompse (1991) J. Exp. M	be inflammatory disorders, in immunologic disorders, cancer in A al., C
Human Interleukin 10.	GeneSeq Accession R42642	W09318783	Interleukins are a group of Interleukin activity can multifunctional cytokines determined using assays known synthesized by lymphocytes, the art: Matthews et al., monocytes, and macrophages. Isymphokines and Interferons: Known functions include Practical Approach, Clemens et stimulating proliferation of eds, IRL Press, Washington, Dimmune cells (e.g., T helper 1987, pp. 221-225; and Thompso cells, B cells, eosinophils, and Snipes et al (1991) J. Exp. M. Isymphocytes), chemotaxis of 173, 507-510. and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Isymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells, C.g., T helper 1987, pp. 221-225; and Thompsoncells, eosinophils, and Snipes et al (1991) J. Exp. Med. Imphocytes), chemotaxis of 173, 507-510. Individual can be inflammatory disorders, cancer al., in munuologic disord	be inflammatory disorders, in immunologic disorders, cancer in A A al., C. c.
Human interleukin-1 beta precursor	GeneSeq Accession R42447	EP569042-	Interleukins are a group of Interleukin multifunctional cytokines determined usynthesized by lymphocytes, the art: M monocytes, and macrophages. <i>Lymphokine</i> Known functions include <i>Practical Apstimulating</i> proliferation of eds, IRL Primmune cells (e.g., T helper 1987, pp. 22 cells, B cells, eosinophils, and al (1989) I elymphocytes), chemotaxis of 334. neutrophils and T lymphocytes, and/or inhibition of interferons.	rleukin activity can rmined using assays known art: Matthews et al., phokines and Interferons: tical Approach, Clemens et IRL Press, Washington, D 7, pp. 221-225, and Kitamura 989) J Cell Physiol. 140 33	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity Ex	Exemplary Activity Assay	Preferred Indication Y
Human interleukin-6	GeneSeg Accession R49041	WO9403492	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Aarden et al cells, eosinophils, and (1987) Eur. J. Immunol 17, 1411-lymphocytes), chemotaxis of 16. and/or inhibition of interferons.	ukin activity can be ined using assays known in t: Matthews et al., in okines and Interferons: A al Approach, Clemens et al., L. Press, Washington, D.C. pp. 221-225; and Aarden et al. Eur. J. Immunol 17, 1411-	be inflammatory disorders, in immunologic disorders, cancer in A A II C
Mutant Interleukin 6 S176R	GeneSed Accession R54990	WO9411402-	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Aarden et al cells, eosinophils, and (1987) Eur. J. Immunol 17, 1411-lymphocytes), chemotaxis of 16. and/or inhibition of interferons.	Interleukin activity can be determined using assays known in the art: Matthews et al., in Lymphokines and Interferons: A Practical Approach, Clemens et al., eds, IRL Press, Washington, D.C. 1987, pp. 221-225; and Aarden et al (1987) Eur. J. Immunol 17, 1411-16.	be inflammatory disorders, in immunologic disorders, cancer in A A A A A A A A A A A A A A A A A A
Interleukin 6	GeneSeq Accession R55256	JP06145063	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Aarden et al. cells, eosinophils, and (1987) Eur. J. Immunol 17, 1411-lymphocytes), chemotaxis of 16. and/or inhibition of interferons.	ukin activity can be ined using assays known in t: Matthews et al., in okines and Interferons: A al Approach, Clemens et al., L Press, Washington, D.C. pp. 221-225; and Aarden et al. Eur. J. Immunol 17, 1411-	be inflammatory disorders, in immunologic disorders, cancer in A al., .C. tal.

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Interleukin 8 (IL-8) receptor	GeneSeq Accession R53932	JP06100595	Interleukins are a group of Interleukin activity cimultifunctional cytokines determined using assays kn synthesized by lymphocytes, the art: Matthews et amonocytes, and macrophages. <i>Lymphokines and Interfer</i> Known functions include <i>Practical Approach</i> , Clemen stimulating proliferation of eds, IRL Press, Washingtoi immune cells (e.g., T helper 1987, pp. 221-225, and Holincells, B cells, eosinophils, and (1991)Science 253, 1278-80. Isomphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	activity can ing assays known thews et al., and interferons: coach, Clemens et s, Washington, D 225, and Holmes et 253, 1278-80.	be Soluble IL-8 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., C.
Human interleukin-7.	GeneSeq Accession R59919	US5328988	Interleukins are a group of Interleukin activity can multifunctional cytokines determined using assays known synthesized by lymphocytes, the art: Matthews et al., monocytes, and macrophages. Isymphokines and Interferons: Known functions include Practical Approach, Clemens et stimulating proliferation of eds, IRL Press, Washington, D immune cells (e.g., T helper 1987, pp. 221-225; and Park et cells, B cells, eosinophils, and (1990) J. Exp. Med. 171, 1073-79. Isymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Isymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Park et al cells, B cells, eosinophils, and (1990) J.Exp. Med. 171, 1073-79. Isymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	be inflammatory disorders, in immunologic disorders, cancer in A A al., .C.
IL-3 containing fusion protein.	GeneSeq Accessions R79342 and R79344	W09521254	Interleukins are a group of Interleukin multifunctional cytokines determined usynthesized by lymphocytes, the art: Mimonocytes, and macrophages. <i>Lymphokines</i> Known functions include <i>Practical Apstimulating</i> proliferation of eds, IRL Pre immune cells (e.g., T helper 1987, pp. 22 cells, B cells, eosinophils, and al (1989) J (lymphocytes), chemotaxis of 334. and/or inhibition of interferons.	rleukin activity can rmined using assays known art: Matthews et al., phokines and Interferons: tical Approach, Clemens et IRL Press, Washington, D, pp. 221-225; and Kitamura, pp. 221-225; and Kitamura (989) J Cell Physiol. 140 33	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
IL-3 mutant proteins	GeneSeq Accessions R79254, R79255, R79256, R79257, R79260, R79261, R79260, R79261, R79264, R79265, R79264, R79267, R79268, R79269, R79270, R79271, R79274, R79273, R79274, R79273, R79274, R79273, R79274, R79273, R79274, R79273, R79278, R79273, R79280, R79281, R79280, R79283, R79284, and R79284, and	W09521254	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.		be inflammatory disorders, cancer in immunologic disorders, cancer al.,
IL-15	GeneSeq Accession R66927	ZA9402636	Interleukins are a group of Interleukin activity can multifunctional cytokines determined using assays kno synthesized by lymphocytes, the art: Matthews et al monocytes, and macrophages. Lymphokines and Interfero Known functions include Practical Approach, Clemens stimulating proliferation of eds, IRL Press, Washington, immune cells (e.g., T helper 1987, pp. 221-225; and Giricells, B cells, eosinophils, and (1994) EMBO J. 13 2822-2830 lymphocytes), chemotaxis of neutrophils and T lymphocytes,	et of test in the second of th	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.

on Y	disorders,	disorders,	disorders,
Preferred Indication Y) ji	disorders,	0.00
Preferred	be inflammatory in immunologic dis in A al., C.	be inflammatory in immunologic dis in A al., .C.	be inflammatory in immunologic dis in A al., .C.
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Assay	can t al., tf al., rferons: mens et geton, D. Hori et 078.	can i known t al., rferons: mens et g	can t al., rferons: mens et s gton, D. Hori et
Activity	activity ng assays thews e and Inte oach, Cle s, Washin 72,25; and 70, 1069-1	activity ng assays thews e and Inter oach, Cle s, Washin 25.	activity ng assays thews e and Inte oach, Cle s, Washin 70, 1069-1
Exemplary Activity Assay	ined usin ined usin ined usin it: Matt. okines cal Approximal Approximal Approximal Approximal Approximately in Section 1990.	Interleukin activity can be determined using assays known in the art: Matthews et al., in Lymphokines and Interferons: A Practical Approach, Clemens et al., eds, IRL Press, Washington, D.C. 1987, pp. 221-225.	Interleukin activity can be determined using assays known in the art: Matthews et al., in Lymphokines and Interferons: A Practical Approach, Clemens et al., eds, IRL Press, Washington, D.C. 1987, pp. 221-225; and Hori et al (1987), Blood 70, 1069-1078.
<u>원</u>	f Interlet determ the au Lymph Practic f eds, II 1987,	f Interled determs determs the an Lymph Practite eds, II.	Interie determine a determine a Lymph Practic eds, IF 1987, (1987), (1
ity	group of Interleukin sytokines determined upphocytes, the art: Maphocytes, Lymphokines include Practical Apration of eds, IRL Pretation of eds, IRL Pretations.	group of ytokines obocytes, ophages. ophages. include ation of T helper othis, and otaxis of phocytes. derons.	a group of Interleukin cytokines determined u lymphocytes, the art: Manacrophages. Lymphokines ns include Practical Apileration of eds, IRL Preg., T helper 1987, pp. 22 sinophils, and (1987), Blood emotaxis of lymphocytes,
Biological Activity	are a globy lyml of macrotions prolifer, (e.g., cosino) of T lymphon of T lymphon of T lymphon of inte	are a g nal c by lyml nd macr ctions prolifer. (e.g., eosinop chemc d T lym	are a grand of long long long long long long long ctions ctions prolifer. (e.g., eosinop chemical Tympa long long long long long long long long
Biologi	Interleukins are a group of Interleukin activity can be multifunctional cytokines determined using assays known in synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells, G.g., T helper 1987, pp. 221-225; and Hori et al cells, B cells, eosinophils, and (1987), Blood 70, 1069-1078. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be multifunctional cytokines determined using assays known in synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. <i>Lymphokines and Interferons: A</i> Known functions include <i>Practical Approach</i> , Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Hori et al cells, B cells, eosinophils, and (1987), Blood 70, 1069-1078. Iymphocytes), chemotaxis of
11	Intermal Intermental Synthesis Synthesis Synthesis Intermediate Synthesis Intermediate Intermedi	mull synt mull synt mon mon Kno stim imm cells lyng lyng neutthe	Intermental multiple synt mon Kno stim imm cells lymi
ıt Numbe	56072	29344	19786
PCT/Patent Number	AU9466072	W09429344	WO9519786
	eq 863018	eg 864240	ρ3 779187
Exemplary Identifier	GeneSeq Accession R63018	GeneSeq Accession R64240	GeneSeq Accession R79187
oeutic in X			
Therapeutic Protein X	IL-12 p40 subunit.	· AGF	Human interleukin-12 40 kD subunit

Preferred Indication Y	Soluble IL-15 receptor polypeptides may be useful for inhibiting interleukin activities.	be inflammatory disorders, in immunologic disorders, cancer in A al., C.	inflammatory disorders, immunologic disorders, cancer
Exemplary Activity Assay	Interleukins are a group of Interleukin activity can be Soluble IL-15 receptor multifunctional cytokines determined using assays known in polypeptides may be useful for synthesized by lymphocytes, the art: Matthews et al., in inhibiting interleukin monocytes, and macrophages. Lymphokines and Interferons: A activities. Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Giri et al cells, B cells, eosinophils, and (1994) EMBO J. 13 2822-2830. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and or inhibition of interferons.	activity can sing assays known tthews et al., and Interferons: voach, Clemens et ss, Washington, D 1-225; and Park et Med. 171, 1073-79.	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Yang et al cells, eosinophils, and (1989) Blood 74, 1880-84. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
Biological Activity	Interleukins are a group of Interleukin activity can multifunctional cytokines synthesized by lymphocytes, the art: Matthews et al. monocytes, and macrophages. Lymphokines and Interferon Known functions include Practical Approach, Clemens stimulating proliferation of eds, IRL Press, Washington, immune cells (e.g., Thelper 1987, pp. 221-225; and Giri cells, B cells, eosinophils, and (1994) EMBO J. 13 2822-2830. Ilymphocytes), chemotaxis of neutrophils and Thymphocytes, and or interferons.	Interleukins are a group of Interleukin multifunctional cytokines determined us synthesized by lymphocytes, the art: Ma monocytes, and macrophages. <i>Lymphokines Known functions include Practical App stimulating proliferation of eds, IRL Presimmune cells</i> (e.g., T helper 1987, pp. 22 cells, B cells, eosinophils, and (1990) J. Exp. lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity multifunctional cytokines determined using assays synthesized by lymphocytes, the art: Matthews et monocytes, and macrophages. <i>Lymphokines and Inter</i> Known functions include <i>Practical Approach</i> , Clen stimulating proliferation of eds, IRL Press, Washing immune cells (e.g., T helper 1987, pp. 221-225; and cells, B cells, eosinophils, and (1989) Blood 74, 1880-84. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
PCT/Patent Number	WO9530695	WO9604306-	WO9604306
Exemplary Identifier	GeneSeq Accession R90843	GeneSeq Accession R92796	GeneSeg Accession R92797
Therapeutic Protein X	Human interleukin-15 receptor from clone P1	Human interleukin-7	interleukin-9

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	\cti	ıry Activity Assay	ją j
interleukin-3	GeneSeq Accession R92801	WO9604306	Interleukins are a group of Interleukin activity can be multifunctional cytokines determined using assays known in synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Kitamura et cells, B cells, eosinophils, and al (1989) J Cell Physiol. 140 323-lymphocytes), chemotaxis of 334. neutrophils and T lymphocytes,	a group of Interleukin activity can be inflammatory disorders cytokines determined using assays known in immunologic disorders, cancer lymphocytes, the art: Matthews et al., in acrophages. Lymphokines and Interferons: A ns include Practical Approach, Clemens et al., ifferation of eds, IRL Press, Washington, D.C. g., T helper 1987, pp. 221-225; and Kitamura et inophils, and al (1989) J Cell Physiol. 140 323-emotaxis of 334.	be inflammatory disorders, in immunologic disorders, cancer in A A A. C. et
Human interleukin-5	GeneSeg Accession R92802	WO9604306	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Kitamura et cells, eosinophils, and al (1989) J Cell Physiol. 140, 323-lymphocytes), chemotaxis of 334. and/or inhibition of interferons.	terleukin activity can be termined using assays known in e art: Matthews et al., in mphokines and Interferons: A vactical Approach, Clemens et al., ls, IRL Press, Washington, D.C. 87, pp. 221-225; and Kitamura et (1989) J Cell Physiol. 140, 323-44.	be inflammatory disorders, in immunologic disorders, cancer in A A A., C.
Recombinant interleukin-16	GeneSeq Accession W33373	DE19617202	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Lim et al cells, eosinophils, and (1996) J. Immunol. 156, 2566-70. Immunol. 156, 2566-70. Immunol. Immu	terleukin activity can be termined using assays known in mphokines and Interferons: A ractical Approach, Clemens et al., is, IRL Press, Washington, D.C. 187, pp. 221-225; and Lim et al 1996) J. Immunol. 156, 2566-70.	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.

Thomanoutia	Dynamalour	DCT Dotont Number	Dialogical A attractor	Decommendation Authorities Account	Ducken J In Beating V
Protein X	Exemplary Identifier	LC1/Fatent inumber	Diviogical Activity	Exculpiary Acuvity Assay	rretied indication r
Human IL-16	GeneSed	DE19617202	Interleukins are a group of	Interleukins are a group of Interleukin activity can be inflammatory disorders	be inflammatory disorders,
Tion of	W33234		synthesized by lymphocytes,	synthesized by lymphocytes, the art: Matthews et al., in	manualogic disorders, career
			monocytes, and macrophages.	monocytes, and macrophages. Lymphokines and Interferons: A	
			Known functions include	Known functions include Practical Approach, Clemens et al.,	
			stimulating proliferation of	stimulating proliferation of eds, IRL Press, Washington, D.C.	
			immune cells (e.g., T helper	immune cells (e.g., T helper 1987, pp. 221-225; and Lim et al	
			cells, B cells, eosinophils, and (1996) J. Immunol. 156, 2566-70.	(1996) J. Immunol. 156, 2566-70.	
			lymphocytes), chemotaxis of		
			neutrophils and T lymphocytes, and/or inhihition of interferons		
Thr117 human	GeneSeq	WO9708321	Interleukins are a group of	group of Interleukin activity can be	be inflammatory disorders,
interleukin 9	Accession		multifunctional cytokines	multifunctional cytokines determined using assays known in immunologic disorders, cancer	immunologic disorders, cancer
	W27521		synthesized by lymphocytes,	synthesized by lymphocytes, the art: Matthews et al., in	
			monocytes, and macrophages.	monocytes, and macrophages. Lymphokines and Interferons: A	
			Known functions include	Known functions include Practical Approach, Clemens et al.,	
			stimulating proliferation of	stimulating proliferation of eds, IRL Press, Washington, D.C.	
			immune cells (e.g., T helper 1987, pp. 221-225.	1987, pp. 221-225.	
			cells, B cells, eosinophils, and		
			lymphocytes), chemotaxis of		
			neutrophils and T lymphocytes,		
			and/or inhibition of interferons.		
Met117 human	GeneSeq	WO9708321	Interleukins are a group of Interleukin	Interleukin activity can be	be inflammatory disorders,
interleukin 9	Accession		multifunctional cytokines	multifunctional cytokines determined using assays known in immunologic disorders, cancer	immunologic disorders, cancer
	W27522		synthesized by lymphocytes,	synthesized by lymphocytes, the art: Matthews et al., in	
			monocytes, and macrophages.	monocytes, and macrophages. Lymphokines and Interferons: A	
			Known functions include	Known functions include Practical Approach, Clemens et al.,	
			stimulating proliferation of	stimulating proliferation of eds, IRL Press, Washington, D.C.	
			immune cells (e.g., T helper	immune cells (e.g., T helper 1987, pp. 221-225; and Yang et al	
,			cells, B cells, eosinophils, and (1989) Blood 74, 1880-84.	(1989) Blood 74, 1880-84.	
			lymphocytes), chemotaxis of		
			neutrophils and T lymphocytes,		
			and/or inhibition of interferons.	,	

Preferred Indication Y	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.	be inflammatory disorders, in immunologic disorders, cancer in A al., C.	flammatory disorders, munologic disorders, cancer
Exemplary Activity Assay	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds. IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Orencole & cells, B cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20. Imphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.		Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Ushio et al cells, B cells, eosinophils, and (1996) J. Immunol. 156, 4274-79. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
Biological Activity	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can multifunctional cytokines determined using assays known synthesized by lymphocytes, the art: Matthews et al., monocytes, and macrophages. Lymphokines and Interferons: Known functions include Practical Approach, Clemens et stimulating proliferation of eds, IRL Press, Washington, Limmune cells (e.g., T helper 1987, pp. 221-225; and Ushio e cells, B cells, eosinophils, and (1996) J. Immunol. 156, 4274-79. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can multifunctional cytokines determined using assays knowr synthesized by lymphocytes, the art: Matthews et al., monocytes, and macrophages. Lymphokines and Interferons. Known functions include Practical Approach, Clemens et stimulating proliferation of eds, IRL Press, Washington, Limmune cells (e.g., T helper 1987, pp. 221-225; and Ushio ecells, B cells, eosinophils, and (1996) J. Immunol. 156, 4274-79. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
PCT/Patent Number	US5817306	EP864585	EP861663
Exemplary Identifier	GeneSeq Accession W80777	GeneSeq Accession W77158	GeneSeq Accession W77077
Therapeutic Protein X	Human intracellular IL- l receptor antagonist.	Human interleukin-18 protein (IL-18)	Human interleukin 18

Preferred Indication Y	nflammatory disorders, mmunologic disorders, cancer	be inflammatory disorders, in immunologic disorders, cancer in A A al., .C.	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.
Exemplary Activity Assay	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Ushio et al cells, B cells, eosinophils, and (1996) J. Immunol. 156, 4274-79. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	activity can sing assays known tthews et al., and Interferons: roach, Clemens et ss, Washington, D -225, and Yang et 74, 1880-84.	Interleukin activity can determined using assays known the art: Matthews et al., Lymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225; and Yang et (1989) Blood 74, 1880-84.
Biological Activity	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity multifunctional cytokines determined using assays synthesized by lymphocytes, the art: Matthews et monocytes, and macrophages. <i>Lymphokines and Inter</i> Known functions include <i>Practical Approach</i> , Cler stimulating proliferation of eds, IRL Press, Washin, immune cells (e.g., T helper 1987, pp. 221-225; and cells, B cells, eosinophils, and (1989) Blood 74, 1880-84 lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity multifunctional cytokines determined using assays synthesized by lymphocytes, the art: Matthews et monocytes, and macrophages. <i>Lymphokines and Inter</i> Known functions include <i>Practical Approach</i> , Cler stimulating proliferation of eds, IRL Press, Washin, immune cells (e.g., T helper 1987, pp. 221-225; and cells, B cells, eosinophils, and (1989) Blood 74, 1880-84. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
PCT/Patent Number	EP861663	WO9827997	WO9827997
Exemplary Identifier	GeneSeq Accessions W77083, W77084, W77085, W77086, W77088, and W77089	GeneSeq Accession W68158	GeneSeq Accession W68157
Therapeutic Protein X	Human interleukin 18 derivatives	Interleukin-9 (IL-9) mature protein (Thr117 version).	IL-9 mature protein variant (Met117 version).

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Human IL-9 receptor protein variant #3.	GeneSeq Accession W64058	WO9824904	Interleukins are a group of Interleukin activity can be multifunctional cytokines determined using assays known in synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Yang et al cells, B cells, eosinophils, and (1989) Blood 74, 1880-84. lymphocytes), chemotaxis of neutrophils and T lymphocytes,	a group of Interleukin activity can be inflammatory disorders cytokines determined using assays known in immunologic disorders, cancer ymphocytes, the art: Matthews et al., in acrophages. Lymphokines and Interferons: A is include Practical Approach, Clemens et al., feration of eds, IRL Press, Washington, D.C. st., T helper 1987, pp. 221-225, and Yang et al inophils, and (1989) Blood 74, 1880-84. https://doi.org/10.1001	be inflammatory disorders, in immunologic disorders, cancer in A al., C.
Human IL-9 receptor protein variant fragment	GeneSeq Accession W64060	WO9824904	Interleukins are a group of Interleukin activity can be Soluble IL-9 receptor multifunctional cytokines determined using assays known in polypeptides may be useful for synthesized by lymphocytes, the art: Matthews et al., in inhibiting interleukin monocytes, and macrophages. Lymphokines and Interferons: A activities. Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Yang et al cells, eosinophils, and (1989) Blood 74, 1880-84. Imphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukin activity can be determined using assays known in the art: Matthews et al., in Lymphokines and Interferons: A Practical Approach, Clemens et al., eds, IRL Press, Washington, D.C. 1987, pp. 221-225; and Yang et al (1989) Blood 74, 1880-84.	be Soluble IL-9 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., C.
Human II9 receptor protein variant fragment#3.	GeneSeq Accession W64061	WO9824904	Interleukins are a group of Interleukin activity can be Soluble I multifunctional cytokines determined using assays known in polypeptides synthesized by lymphocytes, the art: Matthews et al., in inhibiting monocytes, and macrophages. Lymphokines and Interferons: A activities. Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Yang et al., lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	a group of Interleukin activity can be Soluble IL-9 receptor cytokines determined using assays known in polypeptides may be useful for ymphocytes, the art: Matthews et al., in inhibiting interleukin acrophages. Lymphokines and Interferons: A activities. Is include Practical Approach, Clemens et al., feration of eds, IRL Press, Washington, D.C. Str. T. helper 1987, pp. 221-225; and Yang et al inophils, and (1989) Blood 74, 1880-84. Interferons.	be Soluble IL-9 receptor in polypeptides may be useful for in inhibiting interleukin A activities.

Preferred Indication Y	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.
Exemplary Activity Assay	Interleukin activity can determined using assays known the art. Matthews et al., Lymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225; and Hori et (1987), Blood 70, 1069-1078.	.n Dwn 1., Dns: s et s et i, D	Interleukin activity can determined using assays known the art: Matthews et al., Isymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225; and Lim et (1996) J. Immunol. 156, 2566-70.
Biological Activity	Interleukins are a group of Interleukin activity camultifunctional cytokines determined using assays kno synthesized by lymphocytes, the art: Matthews et a monocytes, and macrophages. Lymphokines and Interfero Known functions include Practical Approach, Clemens stimulating proliferation of eds, IRL Press, Washington immune cells (e.g., T helper 1987, pp. 221-225; and Hor cells, B cells, eosinophils, and (1987), Blood 70, 1069-1078. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity camultifunctional cytokines determined using assays known synthesized by lymphocytes, the art: Matthews et a monocytes, and macrophages. <i>Lymphokines and Interfero</i> Known functions include <i>Practical Approach</i> , Clemens stimulating proliferation of eds, IRL Press, Washington immune cells (e.g., T helper 1987, pp. 221-225; and Hot cells, B cells, eosinophils, and (1987), Blood 70, 1069-1078. In neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
PCT/Patent Number	WO9817689	WO9817689	DE19649233.
Exemplary Identifier	GeneSeq Accession W51311	GeneSeq Accession W51312	GeneSeq Accession W63753
Therapeutic Protein X	Human Interleukin-12 p40 protein	Human Interleukin-12 p35 protein	Human protein with IL-16 activity

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Human protein with IL-16 activity	GeneSeq Accession W59425	DE19649233-	Interleukins are a group of Interleukin activity can multifunctional cytokines determined using assays known synthesized by lymphocytes, the art: Matthews et al., monocytes, and macrophages. Lymphokines and Interferons: Known functions include Practical Approach, Clemens et stimulating proliferation of eds, IRL Press, Washington, Dimmune cells (e.g., T helper 1987, pp. 221-225; and Lim et cells, B cells, eosinophils, and (1996) J. Immunol. 156, 2566-70. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Ithe art: Matthews et al., in known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Lim et al., cells, B cells, eosinophils, and (1996) J. Immunol. 156, 2566-70. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and limiting of interferons.	inflammatory disorders, immunologic disorders, cancer
Human interleukin-15	GeneSeq Accession W53878	US\$747024	Interleukins are a group of Interleukin activity carmultifunctional cytokines determined using assays kno synthesized by lymphocytes, the art: Matthews et al monocytes, and macrophages. Lymphokines and Interferon Known functions include Practical Approach, Clemens stimulating proliferation of eds, IRL Press, Washington, immune cells (e.g., T helper 1987, pp. 221-225; and Giri cells, B cells, eosinophils, and (1994) EMBO J. 13 2822-2830 lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	wn is:	be inflammatory disorders, in immunologic disorders, cancer in A A al., .C.
Human wild- type interleukin- 4 (hIL-4) protein	GeneSeq Accession W52149	W09747744	Interleukins are a group of Interleukin activimultifunctional cytokines determined using assynthesized by lymphocytes, the art: Matthews monocytes, and macrophages. <i>Lymphokines and I</i> Known functions include <i>Practical Approach</i> , stimulating proliferation of eds, IRL Press, Wasimmune cells (e.g., T helper 1987, pp. 221-225; cells, B cells, eosinophils, and Mostowski (1990) lymphocytes), chemotaxis of Methods 132,287-295 neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Siegel & cells, B cells, eosinophils, and Mostowski (1990) J Immunol lymphocytes), chemotaxis of Methods 132,287-295. meutrophils and T lymphocytes, and of the control of interferons.	inflammatory disorders, immunologic disorders, cancer

Preferred Indication Y	be inflammatory disorders, in immunologic disorders, cancer in A al., C. I & I we have a solution of the content of the cont	inflammatory disorders, immunologic disorders, cancer
Exemplary Activity Assay	ty can ays known et al., nterferons Clemens et hington, I and Siege J Immu	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Isymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Orencole & cells, B cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
Biological Activity	Interleukins are a group of Interleukin activi multifunctional cytokines determined using ass synthesized by lymphocytes, the art: Matthews monocytes, and macrophages. Lymphokines and I. Known functions include Practical Approach, stimulating proliferation of eds, IRL Press, Was immune cells (e.g., T helper 1987, pp. 221-225; cells, B cells, eosinophils, and Mostowski (1990) lymphocytes), chemotaxis of Methods 132,287-295. neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
PCT/Patent Number	W09747744	W09935268
Exemplary Identifier	GeneSeq Accessions W52150, W52151, W52153, W52154, W52154, W52154, W52156, W52156, W52160, W52161, W52162, W52162, W52163, W52163, W52163, W52164, W52166, W52166,	GeneSeq Accession Y28408
Therapeutic Protein X	interleukin-4 muteins	Human interleukin 1 delta

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Human interleukin-1 receptor antagonist beta	GeneSeq Accession Y24395	WO9935268	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, to monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells, B cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	be inflammatory disorders, in immunologic disorders, cancer in A A A C. C.
Human EDIRF II protein sequence	GeneSeq Accession Y22199	W09932632	Interleukins are a group of merleukin ac multifunctional cytokines determined using synthesized by lymphocytes, the art: Matthe monocytes, and macrophages. Lymphokines and Known functions include Practical Approa stimulating proliferation of eds, IRL Press, immune cells (e.g., T helper 1987, pp. 221-225 cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	activity can sing assays known thews et al., and Interferons: woach, Clemens et ss, Washington, D. 225.	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.
Human EDIRF I protein sequence	GeneSeq Accession Y22197	WO9932632	Interleukins are a group of Interleukin act multifunctional cytokines determined using synthesized by lymphocytes, the art: Matthe monocytes, and macrophages. Lymphokines and Known functions include Practical Approact stimulating proliferation of eds, IRL Press, limmune cells (e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells, e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	inflammatory disorders, immunologic disorders, cancer

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Human IL- IRD10 protein sequence	GeneSeq Accession Y14131	WO9919480	Interleukins are a group of Interleukin activity can be Soluble IL-IRD10 receptor multifunctional cytokines determined using assays known in polypeptides may be useful for synthesized by lymphocytes, the art: Matthews et al., in inhibiting interleukin monocytes, and macrophages. Lymphokines and Interferons: A activities. Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Orencole & cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20. Iymphocytes), chemotaxis of neutrophils and T lymphocytes,	terleukin activity can be termined using assays known in e art: Matthews et al., in imphokines and Interferons: A actical Approach, Clemens et al., is, IRL Press, Washington, D.C. 87, pp. 221-225; and Orencole & inarello (1989) Cytokine 1, 14-20.	be Soluble IL-1RD10 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., c.
Human IL- 1RD9	GeneSeq Accession Y14122	WO9919480	Interleukins are a group of Interleukin activity can be Soluble IL-1RD9 receptor multifunctional cytokines determined using assays known in polypeptides may be useful for synthesized by lymphocytes, the art: Matthews et al., in inhibiting interleukin monocytes, and macrophages. Lymphokines and Interferons: A activities. Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Orencole & cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20. Inhiphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukin activity can be Soluble determined using assays known in polypepti the art: Matthews et al., in inhibiti Lymphokines and Interferons: A activities. Practical Approach, Clemens et al., eds, IRL Press, Washington, D.C. 1987, pp. 221-225; and Orencole & Dinarello (1989) Cytokine 1, 14-20.	be Soluble IL-IRD9 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., C. 0.
Human DNAX interleukin-40	GeneSeq Accession Y09196	WO9919491	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	terleukin activity can be termined using assays known in e art: Matthews et al., in imphokines and Interferons: A actical Approach, Clemens et al., is, IRL Press, Washington, D.C. 187, pp. 221-225.	be inflammatory disorders, in immunologic disorders, cancer in A al.,

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Preferred Indication Y	itory disorders, gic disorders, cancer	itory disorders,	tiory disorders, gic disorders, cancer
Preferi	inflamma immunolog	be inflammatory in immunologic dis in A al., C. al	be inflammatory in immunologic distinction in A al., .C.
Exemplary Activity Assay	Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Isymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells, e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	activity can sing assays known tthews et al., and Interferons: roach, Clemens et ss, Washington, D 1-225; and Lu et nol. Methods 173, I	activity can sing assays known tithews et al., and Interferons: rroach, Clemens et ss, Washington, D.225.
Biological Activity	Interleukins are a group of Interleukin act multifunctional cytokines determined using synthesized by lymphocytes, the art: Matthemonocytes, and macrophages. Lymphokines anc Known functions include Practical Approact stimulating proliferation of eds, IRL Press, Vimmune cells (e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin multifunctional cytokines determined us synthesized by lymphocytes, the art: Mamonocytes, and macrophages. Lymphokines Known functions include Practical Appstimulating proliferation of eds, IRL Preimmune cells (e.g., T helper 1987, pp. 22 cells, B cells, eosinophils, and (1994) Jimmulymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin acmultifunctional cytokines determined using synthesized by lymphocytes, the art: Matthe monocytes, and macrophages. Lymphokines an Known functions include Practical Approasimmune cells (e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
PCT/Patent Number	WO9919491	WO9405318	EP566410
Exemplary Identifier	GeneSeq Accession Y09197	GeneSeq Accession R50176	GeneSeq Accession R43260
Therapeutic Protein X	(DIL-40) alternative sequence	II-11	Human adipogenesis inhibitory factor

Preferred Indication Y	inflammatory disorders, immunologic disorders, cancer	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.	be Soluble IL-17 receptor in polypeptides may be useful for in inhibiting interleukin Alactivities.
Exemplary Activity Assay	Interleukins are a group of Interleukin activity can be inflammatory disorders. multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Lu et al cells, B cells, eosinophils, and (1994) Jimmunol. Methods 173, 19. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	can al., rons: ns et on, D	Interleukin activity can determined using assays known the art: Matthews et al., Lymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225; and Yao et (1995) J. Immunol. 155, 5483-86.
Biological Activity	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, cosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity multifunctional cytokines determined using assays keynthesized by lymphocytes, the art. Matthews et monocytes, and macrophages. Lymphokines and Interference of Enough Practical Approach, Cleme stimulating proliferation of eds, IRL Press, Washingth immune cells (e.g., T helper 1987, pp. 221-225; and Aml cells, B cells, eosinophils, and (1993) PNAS 90, 63330-34. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin multifunctional cytokines determined u synthesized by lymphocytes, the art: Manoncytes, and macrophages. Lymphokines Known functions include Practical Application of eds, IRL Preimmune cells (e.g., T helper 1987, pp. 22 cells, B cells, eosinophils, and (1995) J. Immlymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons
PCT/Patent Number	JP08127539	WO9416074	US6072033
Exemplary Identifier	GeneSeq Accession W02202	GeneSeq Accession R55800	GeneSeq Accession B03807
Therapeutic Protein X	II-11	IL-14	IL-17 receptor

PCT/Patent Number Biologi WO9518826 Interleukins
multifunctional cytokines determined using assays known in synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Yao et al cells, B cells, eosinophils, and (1995) J. Immunol. 155, 5483-86. lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
WO9704097 Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
WO9808870 Interleukins are a group of Interleukin activity can be inflammatory disorders multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Gallagher et cells, B cells, eosinophils, and al (2000) Genes Immun. 1, 442-50. lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.

Exemplary Activity Assay Preferred Indication Y	Interleukins are a group of Interleukin activity can be inflammatory disorders, multifunctional cytokines determined using assays known in immunologic disorders, cancer synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Parrishcells, eosinophils, and Novak et al (2000) Nature 408, 57-lymphocytes), chemotaxis of 63. Ineutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be Soluble IL-8 receptor multifunctional cytokines determined using assays known in polypeptides may be useful for synthesized by lymphocytes, the art: Matthews et al., in inhibiting interleukin monocytes, and macrophages. Lymphokines and Interferons: A activities. Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225, and Holmes et al cells, eosinophils, and (1991)Science 253, 1278-80. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be Soluble type II interleukin-1 multifunctional cytokines determined using assays known in receptor polypeptides may be synthesized by lymphocytes, the art: Matthews et al., in useful for inhibiting monocytes, and macrophages. Lymphokines and Interferons: A interleukin activities. Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Orencole & cells, B cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20. Imphocytes), chemotaxis of neutrophils and T lymphocytes,
Exemplary	a group of Interleukin cytokines determined usinymphocytes, the art: Matt acrophages. Lymphokines of eds, IRL Press g., T helper 1987, pp. 221 einophils, and Novak et al (20 emotaxis of 63. lymphocytes, interferons.	group of Interleukin a cytokines determined usin phocytes, the art: Matt rophages. Lymphokines cinclude Practical Appration of eds, IRL Press T helper 1987, pp. 221-2 phils, and (1991)Science 2 lotaxis of mphocytes, erferons.	group of Interleukin a cytokines determined using the art: Matt rophages. Lymphokines include Practical Appration of eds, IRL Press T helper 1987, pp. 221-2 phils, and Dinarello (1989) notaxis of mphocytes,
Biological Activity	Interleukins are a group of Interleukin activity can be multifunctional cytokines determined using assays known in synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Lymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Parrishcells, B cells, eosinophils, and Novak et al (2000) Nature 408, 57-lymphocytes), chemotaxis of 63. neutrophils and T lymphocytes, and or interferons.	Interleukins are a group of Interleukin activity can be multifunctional cytokines determined using assays known in synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. Isymphokines and Interferons: A Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Holmes et al cells, eosinophils, and (1991)Science 253, 1278-80. Isymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be multifunctional cytokines determined using assays known in synthesized by lymphocytes, the art: Matthews et al., in monocytes, and macrophages. <i>Lymphokines and Interferons: A</i> Known functions include <i>Practical Approach</i> , Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Orencole & cells, B cells, eosinophils, and Dinarello (1989) Cytokine 1, 14-20. Iymphocytes), chemotaxis of neutrophils and T lymphocytes,
PCT/Patent Number	WO0024758	WO9306229	US5464937
Exemplary Identifier	GeneSeq Accession Y92879	GeneSeq Accession R33420	GeneSeq Accession R85480
Therapeutic Protein X	IL-21 (TF)	IL-8 receptor	Human type II interleukin-1 receptor

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Acces	GeneSeq Accession R69632	EP638644	Interleukins are a group of Interleukin multifunctional cytokines determined us	activity can	be Soluble IL-12 receptor in polypeptides may be useful for
			synthesized by lymphocytes, monocytes, and macrophages.	synthesized by lymphocytes, the art: Matthews et al., in inhibiting monocytes, and macrophages. Lymphokines and Interferons: A activities.	inhibiting interleukin activities.
			Known functions include stimulating proliferation of	Known functions include <i>Practical Approach</i> , Clemens et al., stimulating proliferation of eds. IRL Press. Washington. D.C.	
			immune cells (e.g., T helper	immune cells (e.g., T helper 1987, pp. 221-225; and Hori et al	
		·	ceus, B ceus, eosmopnus, and (1987), Biood 70, 1009-1078. [Iymphocytes], chemotaxis of	(1987), B100d 70, 1009-1078.	
			neutrophils and T lymphocytes, and/or inhibition of interferons.		
	GeneSeq	US5440021	ಡ	group of Interleukin activity can be	be Soluble IL-8 receptor B
Acc	Accession R80758		multifunctional cytokines	cytokines determined using assays known in polypeptides may be useful for	polypeptides may be useful for
			synthesized by lymphocytes,	synthesized by lymphocytes, the art: Matthews et al., in inhibiting	inhibiting interleukin
			monocytes, and macrophages.	monocytes, and macrophages. Lymphokines and Interferons: A activities. Room Structions include Density Americal Clement of a	activities.
			stimulating proliferation of	stimulating proliferation of eds, IRL Press, Washington, D.C.	
			immune cells (e.g., T helper	immune cells (e.g., T helper 1987, pp. 221-225; and Holmes et al	
			cells, B cells, eosinophils, and (1991)Science 253, 1278-80	(1991)Science 253, 1278-80.	
			lymphocytes), chemotaxis of		
			neutrophils and T lymphocytes, and/or inhibition of interferons.		
ł	GeneSeq	JP08103276	Interleukins are a group of Interleukin	activity can	be Soluble IL-8 receptor A
Ac	Accession B09989		multifunctional cytokines	multifunctional cytokines determined using assays known in polypeptides may be useful for	polypeptides may be useful for
			synthesized by lymphocytes,	synthesized by lymphocytes, the art: Matthews et al., in inhibiting	inhibiting interleukin
			monocytes, and macrophages.	monocytes, and macrophages. Lymphokines and Interferons: A activities.	activities.
			Known functions include	Known functions include Practical Approach, Clemens et al.,	
			stimulating proliferation of	stimulating proliferation of eds, IRL Press, Washington, D.C.	
			immune cells (e.g., T helper	immune cells (e.g., T helper 1987, pp. 221-225; and Holmes et al	
			cells, B cells, eosinophils, and (1991)Science 253, 1278-80.	(1991)Science 253, 1278-80.	
			lymphocytes), chemotaxis of		
			neutrophils and T lymphocytes,		
			and/or inhibition of interferons.		

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	ry Activity Assay	
Human II8 receptor protein hIL.8RB	GeneSeq Accession B09990	JP08103276	Interleukins are a group of Interleukin activity camultifunctional cytokines determined using assays kn synthesized by lymphocytes, the art: Matthews et a monocytes, and macrophages. Lymphokines and Interfer. Known functions include Practical Approach, Clemen stimulating proliferation of eds, IRL Press, Washington immune cells (e.g., T helper 1987, pp. 221-225; and Holm cells, B cells, eosinophils, and (1991)Science 253, 1278-80. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	own ol., ons: s et s et les e les e	be Soluble IL-8 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., c.c.
Interleukin-2 receptor associated protein p43	GeneSeg Accession R97569	W09621732-	Interleukins are a group of Interleukin activity camultifunctional cytokines determined using assays kno synthesized by lymphocytes, the art: Matthews et a monocytes, and macrophages. <i>Lymphokines and Interfero</i> Known functions include <i>Practical Approach</i> , Clemens stimulating proliferation of eds, IRL Press, Washington immune cells, eosinophils, and (1978) J. Immunol. 120, 2027. Imphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	n own own i., ons: s et s, ot is et	be Soluble IL-2 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., C.
Human interleukin-17 receptor	GeneSeq Accession W04185	WO9629408	Interleukins are a group of Interleukin activity can multifunctional cytokines determined using assays known synthesized by lymphocytes, the art. Matthews et al., monocytes, and macrophages. Lymphokines and Interferons: Known functions include Practical Approach, Clemens et stimulating proliferation of eds, IRL Press, Washington, Dimmune cells (e.g., T helper 1987, pp. 221-225; and Yao et cells, B cells, eosinophils, and (1995) J. Immunol. 155, 5483-86. In neutrophils and T lymphocytes, and/or inhibition of interferons.		be Soluble IL-17 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., C.

Preferred Indication Y	be Soluble IL-11 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., c.C. al	be inflammatory disorders, in immunologic disorders, cancer in A al., .C.	can be inflammatory disorders, known in immunologic disorders, cancer al., in ferons: A aens et al., gton, D.C.
Exemplary Activity Assay	activity can sing assays known tthews et al., and interferons: roach, Clemens et ss, Washington, D 1-225; and Lu et nol. Methods 173, l	Interleukin activity can determined using assays known the art. Matthews et al., Lymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225; and Orencole Dinarello (1989) Cytokine 1, 14-2	activity sing assays tthews et and Inter- roach, Clen ss, Washing 225.
Biological Activity	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin multifunctional cytokines determined us synthesized by lymphocytes, the art: Ma monocytes, and macrophages. <i>Lymphokines</i> Known functions include <i>Practical App</i> stimulating proliferation of eds, IRL Presimmune cells, (e.g., T helper 1987, pp. 221 cells, B cells, eosinophils, and Dinarello (198 lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin acimultifunctional cytokines determined using synthesized by lymphocytes, the art: Matthe monocytes, and macrophages. <i>Lymphokines am</i> Known functions include <i>Practical Approa</i> stimulating proliferation of eds, IRL Press, immune cells (e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.
PCT/Patent Number	WO9619574	WO9623067	US5488032
Exemplary Identifier	GeneSeq Accession R99090	GeneSeq Accession W01911	GeneSeq Accession R92749
Therapeutic Protein X	Human interleukin-11 receptor	Human interleukin-1 receptor accessory protein	AGF Protein

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Human interleukin-1 type-3 receptor	GeneSeq Accession R91064	WO9607739	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukin activity can determined using assays known the art: Matthews et al., Lymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225, and Orencole Dinarello (1989) Cytokine 1, 14-2	be Soluble IL- type-3 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., C. C.
Human interleukin-13 beta receptor	GeneSeq Accession W24972	WO9720926	Interleukins are a group of Interlemultifunctional cytokines determ synthesized by lymphocytes, the armonocytes, and macrophages. Lymph Known functions include Practic stimulating proliferation of eds, IR immune cells (e.g., T helper 1987, I cells, B cells, eosinophils, and al (19 lymphocytes), chemotaxis of 181,29, neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukin activity can determined using assays known the art: Matthews et al., Lymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225; and Boutelier al (1995) J. Immunol. Metho 181,29.	be Soluble IL-13 beta receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., .C. et
Human interleukin-13 alpha receptor	GeneSeq Accession W24973	WO9720926	Interleukins are a group of Interleukin multifunctional cytokines determined by synthesized by lymphocytes, the art: Manonocytes, and macrophages. Lymphokines Known functions include Practical Appsimmune cells (e.g., T helper 1987, pp. 22. cells, B cells, eosinophils, and al (1995) I lymphocytes), chemotaxis of 181,29. neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukin activity can determined using assays known the art: Matthews et al., Lymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225, and Boutelien al (1995) J. Immunol. Metho 181,29.	be Soluble IL-13 alpha receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., C. et

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Preferred Indication Y	be Soluble IL-4 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., C. &	be Soluble IL-12 beta-2 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., c.	be Soluble IL-12 beta-1 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al. c.C.
Exemplary Activity Assay	Interleukin activity can determined using assays known the art: Matthews et al., Lymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225; and Siegel Mostowski (1990) J Immu Methods 132,287-295.	Interleukin activity can determined using assays known the art: Matthews et al., Lymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225; and Hori et (1987), Blood 70, 1069-1078.	Interleukin activity can determined using assays known the art: Matthews et al., Isymphokines and Interferons: Practical Approach, Clemens et eds, IRL Press, Washington, D 1987, pp. 221-225; and Hori et (1987), Blood 70, 1069-1078.
Biological Activity	Interleukins are a group of Interleukin activimultifunctional cytokines determined using assistantical by lymphocytes, the art: Matthews monocytes, and macrophages. <i>Lymphokines and I</i> Known functions include <i>Practical Approach</i> , stimulating proliferation of eds, IRL Press, Wasimunue cells (e.g., T helper 1987, pp. 221-225; cells, B cells, eosinophils, and Mostowski (1990) lymphocytes), chemotaxis of Methods 132,287-295 neutrophils and T lymphocytes,	Interleukins are a group of Interleukin activity camultifunctional cytokines determined using assays knu synthesized by lymphocytes, the art: Matthews et a monocytes, and macrophages. <i>Lymphokines and Interferentional Approach, Clementional Approach, Clementional Approach, Clementional Approach, Clementional Approach, Clementional Cells, G.g., Thelper 1987, pp. 221-225; and Honcells, B cells, eosinophils, and (1987), Blood 70, 1069-1078 and/or inhibition of interferons.</i>	Interleukins are a group of Interleukin activity ca multifunctional cytokines determined using assays knowlifunctional cytokines determined using assays known synthesized by lymphocytes, the art: Matthews et a monocytes, and macrophages. Lymphokines and Interferon Known functions include Practical Approach, Clemens stimulating proliferation of eds, IRL Press, Washington immune cells (e.g., T helper 1987, pp. 221-225; and Hor cells, B cells, eosinophils, and (1987), Blood 70, 1069-1078. In neutrophils and T lymphocytes, and/or inhibition of interferons.
PCT/Patent Number	US5599905	EP759466	EP759466
Exemplary Identifier	GeneSeq Accession WI3499	GeneSeq Accession W12771	GeneSeq Accession W12772
Therapeutic Protein X	Human interleukin-4 receptor ·	Human interleukin-12 beta-2 receptor	Human interleukin-12 beta-1 receptor.

Preferred Indication Y	can be Soluble IL-9 receptor known in polypeptides may be useful for al., in inhibiting interleukin terose al., ton, D.C. fang et al.	be Soluble IL-10 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., C. c. ed.	can be Soluble IL-6 receptor known in polypeptides may be useful for al., in inhibiting interleukin erons: A activities. ens et al., ton, D.C. uden et al. 17, 1411-
Exemplary Activity Assay	Interleukin activity determined using assays the art: Matthews et Lymphokines and Intery Practical Approach, Clerr eds, IRL Press, Washing 1987, pp. 221-225; and Y (1989) Blood 74, 1880-84.	activity can assing assays known atthews et al., and Interferons: proach, Clemens et sss, Washington, D 1-225; and Thompse (1991) J. Exp. M	erleukin activity ermined using assays art: Matthews et nphokines and Interf cetical Approach, Clem , IRL Press, Washing 17, pp. 221-225, and Aa 87) Eur. J. Immunol
Biological Activity	Interleukins are a group of Interleukin activity multifunctional cytokines determined using assays synthesized by lymphocytes, the art: Matthews et monocytes, and macrophages. <i>Lymphokines and Intery</i> Known functions include <i>Practical Approach</i> , Clers stimulating proliferation of eds, IRL Press, Washing immune cells (e.g., T helper 1987, pp. 221-225; and 7 cells, B cells, eosinophils, and (1989) Blood 74, 1880-84. lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin multifunctional cytokines determined usynthesized by lymphocytes, the art: Mismonocytes, and macrophages. Lymphokines Known functions include Practical Appstimulating proliferation of eds, IRL Preimmune cells (e.g., T helper 1987, pp. 221 cells, B cells, eosinophils, and Snipes et allymphocytes), chemotaxis of 173, 507-510. and/or inhibition of interferons.	Interleukins are a group of Int multifunctional cytokines det synthesized by lymphocytes, the monocytes, and macrophages. Ly, Known functions include Prestimulating proliferation of edsimmune cells (e.g., T helper 198 cells, B cells, eosinophils, and (19 lymphocytes), chemotaxis of 16, neutrophils and T lymphocytes, and/or inhibition of interferons.
PCT/Patent Number	WO9824904	US5716804	JP11196867
Exemplary Identifier	GeneSeq Accessions W64055, W64056, and W64057	GeneSeq Accession W41804	GeneSeq Accession Y30938
Therapeutic Protein X	Human IL-9 receptor protein	IL-10 receptor	Human IL-6 receptor

Preferred Indication Y	Soluble IL-17 receptor polypeptides may be useful for inhibiting interleukin activities.	known in polypeptides may be useful for al., in inhibiting interleukin erons: A activities. tens et al., ton, D.C. Yao et al 83-86.	can be Soluble IL-3 receptor known in polypeptides may be useful for al., in inhibiting interleukin erons: A activities. tens et al., ton, D.C. tianura et 140 323-
Exemplary Activity Assay	Interleukins are a group of Interleukin activity can be Soluble IL-17 receptor multifunctional cytokines determined using assays known in polypeptides may be useful for synthesized by lymphocytes, the art: Matthews et al., in inhibiting interleukin monocytes, and macrophages. Lymphokines and Interferons: A activities. Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Yao et al., cells, B cells, eosinophils, and (1995) J. Immunol. 155, 5483-86. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukin activity determined using assays the art: Matthews et Lymphokines and Intery Practical Approach, Clemeds, IRL Press, Washing 1987, pp. 221-225; and (1995) J. Immunol. 155, 54	activity sing assays ithews et and Intery woach, Clem ss, Washing -225; and K.
Biological Activity	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin multifunctional cytokines determined using synthesized by lymphocytes, the art: Mat monocytes, and macrophages. <i>Lymphokines</i> Known functions include <i>Practical Appreximalisty</i> Stimulating proliferation of eds, IRL Presimmune cells (e.g., T helper 1987, pp. 221 cells, B cells, eosinophils, and (1995) J. Immulymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin multifunctional cytokines determined usynthesized by lymphocytes, the art: Mamonocytes, and macrophages. <i>Lymphokines</i> Known functions include <i>Practical Appsitionaling</i> proliferation of eds, IRL Preimmune cells (e.g., T helper 1987, pp. 221 cells, B cells, eosinophils, and al (1989) J C lymphocytes), chemotaxis of 334. and/or inhibition of interferons.
PCT/Patent Number	US6096305	US6100235	EP509826
Exemplary Identifier	GeneSeq Accession Y97181	GeneSeq Accession Y97131	GeneSeq Accession R25300
Therapeutic Protein X	II-17 receptor	II-17 receptor	human interleukin-3 receptor

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
Human GM- CSF receptor	GeneSeq Accession R10919	WO9102063	Interleukins are a group of Interleukin aci multifunctional cytokines determined using synthesized by lymphocytes, the art: Matthe monocytes, and macrophages. Lymphokines and Known functions include Practical Approaci stimulating proliferation of eds, IRL Press, Vimunue cells (e.g., T helper 1987, pp. 221-225, cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be Soluble GM-CSF receptor multifunctional cytokines determined using assays known in polypeptides may be useful for synthesized by lymphocytes, the art: Matthews et al., in inhibiting interleukin monocytes, and macrophages. Lymphokines and Interferons: A activities. Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225. cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Soluble GM-CSF receptor polypeptides may be useful for inhibiting interleukin activities.
Human IL-5 receptor alpha chain	GeneSeq Accession R25064	EP492214	Interleukins are a group of Interleukin multifunctional cytokines determined us synthesized by lymphocytes, the art: Mamonocytes, and macrophages. Lymphokines Known functions include Practical Appstimulating proliferation of eds, IRL Precimencells (e.g., T helper 1987, pp. 221-cells, B cells, eosinophils, and al (1989) J Calymphocytes), chemotaxis of 334. and/or inhibition of interferons.	activity can ting assays known thews et al., and Interferons: roach, Clemens et ss, Washington, D 225; and Kitamurall Physiol. 140, 33	be Soluble IL-5 receptor alpha in polypeptides may be useful for in inhibiting interleukin A activities. al., .C.
Il-5 receptor	GeneSeq Accession W82842	WO9847923	Interleukins are a group of Interleukin activity multifunctional cytokines determined using assays synthesized by lymphocytes, the art: Matthews et monocytes, and macrophages. Isymphokines and Interstimulating proliferation of eds, IRL Press, Washin immune cells (e.g., T helper 1987, pp. 221-225; and scells, B cells, eosinophils, and al (1989) I Cell Physiol. Iymphocytes), chemotaxis of 334. and/or inhibition of interferons.	1 5 8 60 7	can be Soluble IL-5 receptor known in polypeptides may be useful for al., in inhibiting interleukin grons: A activities. tens et al., ton, D.C. tamura et 140, 323-

Therapeutic Protein X	Exemplary Identifier	PCT/Patent Number	Biological Activity	Exemplary Activity Assay	Preferred Indication Y
II-6 receptor	GeneSeq Accession R37215	JP05091892	Interleukins are a group of Interleukin multifunctional cytokines determined us synthesized by lymphocytes, the art: Mat monocytes, and macrophages. Lymphokines Known functions include Practical Approximulating proliferation of eds, IRL Presimmune cells (e.g., T helper 1987, pp. 221-cells, B cells, eosinophils, and (1987) Eur. J lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	activity can ing assays known thews et al., and Interferons: oach, Clemens et s, Washington, D 225; and Aarden e. Immunol 17, 14	be Soluble IL-6 receptor in polypeptides may be useful for in inhibiting interleukin A activities. al., C. tal
human B cell stimulating factor-2 receptor	GeneSeg Accession P90525	AU8928720	Interleukins are a group of Interleukin act multifunctional cytokines determined using synthesized by lymphocytes, the art: Matthe monocytes, and macrophages. Lymphokines am Known functions include Practical Approactional and Practical Approaction of eds, IRL Press, Vimulating proliferation of eds, IRL Press, Vimunue cells (e.g., T helper 1987, pp. 221-225, cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	activity can sing assays known tthews et al., and Interferons: roach, Clemens et ss, Washington, D 225.	be Soluble B cell stimulating in factor-2 receptor polypeptides in may be useful for inhibiting A interleukin activities. al., C.
IL-7 receptor clone	GeneSeq Accession R08330	EP403114	Interleukins are a group of multifunctional cytokines synthesized by lymphocytes, monocytes, and macrophages. Known functions include stimulating proliferation of immune cells (e.g., T helper cells, B cells, eosinophils, and lymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Interleukins are a group of Interleukin activity can be Soluble IL-7 receptor multifunctional cytokines determined using assays known in polypeptides may be useful for synthesized by lymphocytes, the art: Matthews et al., in inhibiting interleukin monocytes, and macrophages. Lymphokines and Interferons: A scivities. Known functions include Practical Approach, Clemens et al., stimulating proliferation of eds, IRL Press, Washington, D.C. immune cells (e.g., T helper 1987, pp. 221-225; and Park et al cells, B cells, eosinophils, and (1990) J. Exp. Med. 171, 1073-79. Iymphocytes), chemotaxis of neutrophils and T lymphocytes, and/or inhibition of interferons.	Soluble IL-7 receptor polypeptides may be useful for inhibiting interleukin activities.

PCT/Patent Number
Accession R06512 WO9008822 EFO Receptor is involved in the EFO Receptor activity can be inflammatory disorders, proliferation and differentiation determined using assays known in immunologic disorders, the art, such as, J Biol Chem 2001 cancer, erythroblast Mar 23,276(12):8995-9002; JAK2 proliferation and protein tyrosine kinase activity; differentiation Blood 1994 Sep 1;84(5):1501-7 and Mol Cell Biol. 1994 Oct;14(10):6506-14.
GeneSeq WO9530695 Accession R90843
GeneSeq WO9507984 Activities associated with Apoptosis activity, NF-kB Soluble 4-1BB receptor apoptosis, NF-kB activation, activation, and B and T cell coally and co-stimulation of immune stimulation can be determined using inhibiting apoptosis, NF-kB cells such as T and B cells. Song HY etal., 1997 Proc Natl Acad Such as B and T cells. Soi U S A 94(18):972-6; Epsevik and T cells. Immunol. Methods.

Preferred Indication Y	NF-kB Soluble BCMA receptor cell co-polypeptides may be useful for ed using inhibiting apoptosis, NF-kB foore et activation, and/or co-):260-3; stimulation of immune cells atl Acad such as B and T cells. Epsevik 86, J.	Soluble CD27 polypeptides may be useful for inhibiting apoptosis, NF-kB activation, t and/or co-stimulation of immune cells such as B and T cells.	Soluble CD30 polypeptides may be useful for inhibiting apoptosis, NF-kB activation, t and/or co-stimulation of immune cells such as B and T cells.
Exemplary Activity Assay	Activities associated with Apoptosis activity, NF-kB Soluble BCMA receptor apoptosis, NF-kB activation, activation, and B and T cell copolypeptides may be useful for and co-stimulation of immune stimulation can be determined using inhibiting apoptosis, NF-kB assays known in the art: Moore et activation, and/or colla, 1999, Science, 285(5425):260-3; stimulation of immune cells. Song HY etal., 1997 Proc Natl Acad such as B and T cells. Sci U S A 94(18):9792-6; Epsevik and Nissen-Meyer, 1986, J. Immunol. Methods.	Activities associated with Apoptosis activity, NF-kB Soluble CD27 polypeptides apoptosis, NF-kB activation, activation, and B and T cell comay be useful for inhibiting and co-stimulation of immune stimulation can be determined using apoptosis, NF-kB activation, assays known in the art: Moore et and/or co-stimulation of al., 1999, Science, 285(5425):260-3; immune cells such as B and T Song HY etal., 1997 Proc Natl Acad cells. Sci U S A 94(18):9792-6; Epsevik and Nissen-Meyer, 1986, J. Immunol. Methods.	Activities associated with Apoptosis activity, NF-kB Soluble CD30 polypeptides apoptosis, NF-kB activation, and B and T cell complete useful for inhibiting and co-stimulation of immune stimulation can be determined using apoptosis, NF-kB activation, assays known in the art: Moore et and/or co-stimulation of al., 1999, Science, 285(5425):260-3; immune cells such as B and T Song HY etal., 1997 Proc Natl Acad cells. Sci U S A 94(18):9792-6; Epsevik and Nissen-Meyer, 1986, J. Immunol. Methods.
Biological Activity	Activities associated with apoptosis, NF-kB activation, and co-stimulation of immune cells such as T and B cells.	Activities associated with apoptosis, NF-kB activation, and co-stimulation of immune cells such as T and B cells.	Activities associated with apoptosis, NF-kB activation, and co-stimulation of immune cells such as T and B cells.
PCT/Patent Number	WO0068378	WO9201049	DE4200043
Exemplary Identifier	GeneSeq Accession Y71979	GeneSeq Accession R20814	GeneSeq Accession R35478
Therapeutic Protein X	BCMA	CD27	CD30